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THE LOWER CRETACEOUS GRYPHÆAS OF THE TEXAS REGION.—Hill and Vaughan

WASHINGTON
GOVERNMENT PRINTING OFFICE
1898

UNITED STATES GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

THE LOWER CRETACEOUS GRYPHÆAS OF THE TEXAS REGION

BY

ROBERT THOMAS HILL
AND
THOMAS WAYLAND VAUGHAN

WASHINGTON
GOVERNMENT PRINTING OFFICE
1898

THE LOWER CRETACEOUS GRYPHÆAS OF THE TEXAS REGION.

BY

ROBERT THOMAS HILL and THOMAS WAYLAND VAUGHAN.

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LETTER OF TRANSMITTAL.

Department of the Interior,
United States Geological Survey,
Washington, D. C., January 13, 1897.

SIR: I transmit herewith, for publication, a paper entitled The Lower Cretaceous Gryphæas of the Texas Region, which has been prepared jointly by Mr. Thomas Wayland Vaughan, assistant geologist, and myself.

Very respectfully,

ROBT. T. HILL,
Geologist.

TO THE DIRECTOR,
United States Geological Survey.

THE LOWER CRETACEOUS GRYPHÆAS OF THE TEXAS REGION.

By Robert T. Hill and T. Wayland Vaughan.

INTRODUCTION.

The present paper treats of the specific classification, stratigraphic occurrence, and relationships of one particular group of the many kinds of fossil oysters occurring in the Lower Cretaceous formations of Texas. This group includes those forms which have generally been referred to *Gryphœa pitcheri* of Morton. Owing to the plentiful occurrence of the shells of these oysters in the formations mentioned, this group is of great importance from many standpoints, and a thorough knowledge of the forms composing it has the utmost economic value because of the assistance which they render in determining the stratigraphic position of various beds in the geologic sections. In two instances within the last year, by the aid of these fossils, brought up from great depths in diamond-drill cores, cities in Texas upon the point of abandoning the attempt to procure artesian water have been warranted in drilling a few feet farther, where the desired artesian flow was procured. Unfortunately, however, this group of fossils has not been properly understood or classified, owing to the inadequate manner in which they were originally described and published. These descriptions were often based upon single specimens or incomplete collections made in the hasty reconnoissances of early frontier expeditions and were unaccompanied by stratigraphic data. The species from the Texas region have usually been based upon one or two poor specimens, accidentally picked up without record of stratigraphic occurrence, and described by a paleontologist unacquainted with the stratigraphic relations of the rocks in which they were found. Other species have been made from variations of some previously described form. The forms have also become involved in a confusion of nomenclature and controversy, so that the student can not obtain from the literature a proper conception of their occurrence, distribution, and classification.

A controversy between Prof. Jules Marcou on the one hand and nearly all the eminent American paleontologists of the day on the other early arose concerning the species *Gryphæa pitcheri* and the formations in which it was found. Upon the finding at Tucumcari Mesa, New Mexico, of two fossil oysters which he termed *Gryphæa dilatata* var. *tucumcarii* and *Ostrea marshii* (Marcou, not Sowerby), Professor Marcou announced the existence there of rocks of the Jurassic age. He likewise asserted the existence of Lower Cretaceous strata at Comet Creek, on the head waters of the False Washita, a locality in what is now known as Oklahoma, basing this conclusion upon the existence of a single species of fossil oyster in strata of lumachelle limestone aggregating only a few feet in thickness.

Professor Marcou in his many papers has variously described these beds and their thickness, and has successively referred this species as follows: "*Exogyra ponderosa* Roemer" (provisionally), "*Ostrea aquili* or *couloni* (?)," "*Exogyra pitcheri*," "*Gryphæa pitcheri*," "*Gryphæa pitcheri* var. *navia*, Hall and Conrad," "*Gryphæa roemeri*," "*Gryphæa pitcheri*, and *Gryphæa roemeri* again. Inasmuch as much controversy has taken place concerning the thickness of the beds and the nomenclature of the fossil, we append the following extracts from his writings, giving the facts in full:

1855.—This limestone is only 5 feet thick; it is of a whitish gray color, containing an immense quantity of Ostracea, which I consider (provisionally) as the *Exogyra ponderosa* Roemer; having the closest analogy with the Exogyra of the Neocomien of the environs of Neufchâtel. [United States Pacific Railroad Explorations, 1853–54, Vol. IV, p. 43, H. Doc. 129. Washington, 1855.]

1858.—This limestone is only 5 feet thick; it is of a whitish gray color, containing an immense quantity of Ostracea, which I consider as identical with the *Exogyra* (*Gryphæa*) *pitcheri* Mort., having the closest analogy with the *Exogyra couloni* of the Neocomian of the environs of Neuchâtel (Switzerland). [Geology of North America, Zurich, 1858, p. 17. This passage purports to be a verbatim copy of the above paragraph and is from the chapter entitled "Extract from report of explorations for a railway route, near the thirty-fifth parallel of latitude, from the Mississippi River to the Pacific Ocean," etc., Washington, 1855, H. R. Doc. 129.]

1858.—In the literal copy and translation of Prof. Jules Marcou's field notes by W. P. Blake, page 131, Volume III, of the Pacific Railway reports, quarto edition of 1856, the Comet Creek locality, near camp 31, is described as composed of "three or four broken beds with crinoids disseminated here and there as if the ruins were formed of a lumachelle limestone of Neocomien age. This lumachelle is formed by the fragments of *Ostrea aquila* or *couloni* or a variety, for it is smaller. · · · · the four beds of lumachelle are 2 feet thick." Concerning these notes, however, Mr. Marcou later said: "I here declare that I know nothing of the publication of the edition in quarto of these reports, and that I decline all responsibility as to the use that may have been or may hereafter be made by others of my official notebooks," etc. (Geology of North America, etc., Zurich, 1858, p. 1.)

1858.—On page 27 of the Geology of North America, Mr. Marcou says, in discussing his Neocomian in America, of which this is the only locality recorded as seen by him, that "its thickness varies from 6 to 50 feet."

> *1862.*—I have never seen Morton's original specimen. • • • I am led to believe that I did not meet with the true *G. pitcheri* of Morton in my explorations with Captain Whipple's party. Mr. Ferdinand Roemer having the opportunity of seeing in the company of the late Dr. Morton himself the original specimen at Philadelphia, I naturally followed his identification of *G. pitcheri;* and if Roemer has made a mistake I was misled by his description. • • • Thus we shall have three species of Gryphæa: 1, the *G. tucumcarii* of the Jurassic rocks of Pyramid Mount (New Mexico); 2, the false *G. pitcheri*, of Roemer and Marcou, or the false *G. pitcheri* var. *navia* of Conrad and Hall, of the Cretaceous rocks of the false Washita River (Texas), which may be called *G. roemeri* in honor of its first discoverer, Mr. F. Roemer; and 3, the true *G. pitcheri*, Morton, which I have never seen, and consequently on which I can not give any information as to its stratigraphical position and association with other fossils. [Proc. Boston Soc. Nat. Hist., Vol. VIII, p. 95, 1862.]
>
> *1889.*—As to the *Gryphæa pitcheri* which Mr. Hall calls *var. navia*, it is the true *G. pitcheri* of Morton and Roemer, found by me at Comet Creek, near the false Washita River. [American Geologist, September, 1889, p. 163.]
>
> *1896.*—The first strata of this Cretaceous system contain at Comet Creek, Fort Washita, etc., an immense number of *Gryphæa Roemeri* Marcou (formerly called *G. Pitcheri* by Roemer and Marcou). The *Gryphæa* are so numerous as to recall the "Limestone of the *Gryphæa arcuata* Lias of England, France, and Germany." These first beds, which may be called "Caprina and Gryphæa Roemeri limestone," are the bottom beds of the American Neocomian or Lower Cretaceous. [The Jura of Texas, by Jules Marcou, Proc. Boston Soc. Nat. Hist., vol. 27, p. 157, Boston, October, 1896.)

Prof. James Hall and Dr. B. F. Shumard, supported by Prof. James D. Dana, were the chief opponents of Professor Marcou's views. They correctly alleged that the species variously termed by him *G. tucumcari*, *G. dilatata*, etc., were identical with Morton's *G. pitcheri*, and correlated the Tucumcari beds with the Cretaceous instead of the Jurassic, to which age Professor Marcou referred them. This controversy,[1] carried on without knowledge of the stratigraphy, and primarily based upon the identity or nonidentity of Marcou's *G. tucumcari* with *G. pitcheri*, established the custom of referring nearly all the known gryphæas of the Southwest to the little-understood *G. pitcheri* of Morton. A cloud was also cast upon the value of the descriptions and figures of Cretaceous fossils which had been sent to Professor Marcou from Fort Washita, Indian Territory, and Texas by Captain Pope and Dr. G. G. Shumard, and described and figured by him in his Geology of North America. With the exception of Roemer's, those were the best illustrated figures of fossils from the Texas region, but unfortunately their exact stratigraphic position was unknown at that time. His now well-known species *Exogyra sinuata* var. *americana*, for instance, was strongly asserted to be identical with *Exogyra ponderosa* Roemer,[1] and whatever of worth there may have been in his work was largely overlooked in the criticism of its errors, and confused by his own subsequent controversial discussions.

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[1] The substance of this controversy may be found in J. D. Dana's "Review of Marcou's Geology of North America," in the American Journal of Science, November, 1858, pp. 323-333; and in the same journal for January, 1859, pp. 137-141.

Of all who participated in the discussion, Professor Marcou and Dr. B. F. Shumard were the only ones who had seen or collected the fossils in situ; and neither of these had seen or understood the stratigraphic relations of the Cretaceous section in its entirety as it is now known. Dr. Shumard seems to have overlooked any varietal differences in the gryphæas. Professor Marcou later admitted[2] that the form which he called *G. pitcheri* might not be that species at all, and insisted that his *G. dilatata* var. *tucumcarii* was different from it. The others insisted that the form *G. dilatata* var. *tucumcari*, which Professor Marcou stoutly maintained was distinct, was the true *G. pitcheri*.

Professor Marcou, unfortunately, has never seen the Cretaceous formation in Texas or the main area of its occurrence in Indian Territory as at present constituted, his itinerary having taken him entirely to the north of the Ouachita range,[3] which separates the fragmentary, disconnected, and attenuated outlying areas of Kansas and Oklahoma from the true Texas region and its extension into the Chickasaw and Choctaw Nations. The "2," "4," or "5" feet of the Lower Cretaceous limestone which he saw at Comet Creek, Oklahoma, and the few feet of Cretaceous near Tucumcari, New Mexico, represent merely a horizon in a single one of the three divisions of the series. (See Pl. XXXIV.) His entire observation of the beds of both localities was not of a half day's duration.

Dr. Shumard's erroneous section[4] of the Texas Cretaceous completely obscured for the time being the sequence of the Cretaceous formations. Professor Marcou protested[5] upon theoretical grounds against the correctness of this section, but his objections carried little weight owing to the bitterness of the controversy in which he had become involved.

These misconceptions concerning the Cretaceous formations arose in the earlier days of American geology, before the Arkansas-Texas region had been explored. It was the general opinion at that time that there were no marine strata in the United States comparable to the Lower Cretaceous strata of Europe, and that the Cretaceous formations of our country were conspicuously devoid of chalky deposits, and hence were exceptional by the absence of what is their most characteristic litho-paleontologic feature in other parts of the world and the one from which the name of the group is derived. These opinions were the logical result of what was then known of the American Cretaceous formations. Knowledge of this group was at first mostly confined to the strata of New Jersey, which, although devoid of any chalky material, are, as shown by their fossils, homotaxially equivalent to the Upper Chalks of Europe. The New Jersey deposits were also supposed to represent, stratigraphically and faunally, all of the American Cretaceous section, when in fact, as we now know, they are only the uppermost beds of the upper division of the American Cretaceous, and in no manner indicate the great development of the lower beds of the Southwestern States.

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[1] Am. Jour. Sci., 2d series, Vol. XXVI, 1858, p. 331.

[2] See extract from his writings, paragraph on p. 15 of this paper.

[3] At several times Professor Marcou in his writings has conveyed the impression that he had seen the Cretaceous at Fort Washita, Indian Territory, and in Texas. (See American Geologist, Aug., 1894, p. 100.) The various journals, itineraries, and maps of the Pacific Railway expedition, as published by himself and others, giving a minute record of the progress of the party day by day, show that it nowhere encountered these localities or any other south of the Ouachita Mountains. The fossils described by him in his Geology of North America and elsewhere, from Fort Washita, were collected and sent to him by Dr. G. G. Shumard, and those from the Cross Timbers of Texas by Captain Pope, of the Thirty-second Parallel Survey.

[4] Trans. Acad. Sci. St. Louis, Vol. I, 1860, p. 583.

[5] Boston Soc. Nat. Hist., Vol. VIII, 1862, p. 93.

The Arkansas-Texas section shows the presence in America, as well as in Europe, of a most perfect sequence of Cretaceous deposits, from the Wealden (Trinity) beds to the equivalents of the Senonian, which embraces all Cretaceous time.

In the year 1886 it was shown[1] that current misconceptions of the Texas Cretaceous and its fossil species were largely due to the fact that underlying the hitherto supposed base of the beds of that period there was another lower and entirely distinct series of rocks, to which the name Comanche series was soon given, and that its fossils, collected at various times, had all been erroneously confused with the overlying Meek and Hayden section, which hitherto had been supposed to embrace the entire range of the North American Cretaceous. As a natural result of these misconceptions the stratigraphic occurrence of the Cretaceous Ostreidæ in general, although they are the best preserved and the most abundant of our fossils, was but little understood and has not been properly presented.

One of the first results of the separation of the Comanche series from the Upper Cretaceous was the discovery of the fact that the numerous forms of fossil Ostreidæ, then known by the name of *Gryphœa pitcheri*, *G. dilatata* var. *tucumcarii*, etc., were characteristic of and restricted in occurrence to this Lower Cretaceous series.

Mr. Stanton's[2] recent studies of Newberry and Schiel's *Gryphœa pitcheri* from the Upper Cretaceous of New Mexico and Utah show it to be a distinct species (*G. newberryi* Stanton) and removes the last vestige of *G. pitcheri* from the Upper Cretaceous.

The writers have visited every one of the historic type localities from which these forms were originally described and have studied minutely their stratigraphic occurrence, range, and association. Collections have been made, not of a few adults only, such as have usually been figured, but of specimens in every stage of growth and variation.

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[1] The paper, with printed sections, was presented before the Philosophical Society of Washington in December, 1886, and published in the Am. Jour. Sci., 3d series, Vol. XXXIII, 1887, pp. 298-299.

[2] Bull. U. S. Geol. Survey No. 106, 1893, pp. 60-62.

In the paper and section previously mentioned three distinct horizons of the several forms of so-called *Gryphæa pitcheri* were pointed out, one below the Comanche Peak fauna, associated with *Exogyra texana*, another at the base of the Washita division, above the "Hippurites" or Caprina (Edwards[1]) limestone, consisting of Dr. C. A. White's *E. forniculata* (*G. navia*, Hall); and another in the Washita division associated with *Ostrea carinata*. Still later it was discovered that another variety, Roemer's *G. pitcheri*, occurred only at the top of the Del Rio (*Exogyra arietina*) clays in a very persistent zone.

As studies of the Comanche series progressed, another important fact became apparent. The forms called *Gryphæa pitcheri* by Morton, Roemer, Marcou, and others each came from a different stratigraphic position in the Comanche series, and might or might not be distinct species, or varieties of the same species, which upon close study of abundant material could be defined so as to be of stratigraphic value.

At this time (1886) opinions of what constituted *G. pitcheri* Morton were formed largely from the accepted literature, and it was believed, with Roemer, White, and others, that the former's figures represented the type of the true *G. pitcheri*. As now shown in this work, this was an erroneous opinion, which has caused much trouble. Studies of the uppermost Comanche beds in the littoral regions of Denison, Texas; Tucumcari, New Mexico; and southern Kansas, which have since been published, had not been completed at that date. Later the senior author made special trips to Tucumcari mesa, where only a small portion of the entire Comanche series is revealed, in order to ascertain the facts as to Professor Marcou's locality. *Gryphæa tucumcarii* was found in abundance, and he was strongly impressed with the fact that this was a distinct species; but upon this trip its accompanying fauna of Washita fossils was not discovered, and he supposed that Marcou had ground for assigning these beds to the Jurassic, and for a short time was inclined to support Marcou's position.[2] Later, in 1889, he made a detailed study of the peculiar Denison (Texas) section,[3] which, as has been recently shown, has marked variation from the Comanche series in central Texas, and saw in them paleontologic evidence which led to the belief that the Tucumcari beds were equivalent in part thereto. On a second visit to Tucumcari an abundant fauna was found accompanying *G. tucum-*

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[1] Geographic designations will hereafter be used for the various terranes of the Cretaceous group in Texas, instead of paleontologic denominations, in accordance with a system adopted by the Survey.

[2] Rept. Geol. Survey Arkansas for 1888, Vol. II, 1888, pp. 172-173.

[3] See Bull Geol. Soc. America, Vol. V, 1894, pp. 297-338.

carii identical in species with those of the Denison beds of the top of the Comanche series, thereby fixing the stratigraphic position of Marcou's Tucumcari species.[1]

This extensive collection from Tucumcari, and those made by Hyatt, and later by the collectors of the Texas survey, all show that the variety *tucumcarii* of Marcou occurs in association with a characteristic and unmistakable fauna[2] of the Washita division (the uppermost division of the Comanche series), the same to which belongs his (Marcou's) *G. pitcheri* beds of Comet Creek,[3] Oklahoma, which he called Cretaceous. Furthermore, *G. corrugata* Say, of which Marcou's *G. tucumcarii* is but a variety, was later found in abundance in the Red River region of Texas and Indian Territory, southern Kansas, and Oklahoma, in association with an undoubted Washita fauna, including the species *Ammonites shumardi*, Marcou, described by him as a Cretaceous species, and which Professor Hyatt found in the Tucumcari beds. The exact horizon of this ammonite in Texas is at the top of the Kiamitia beds, which are principally composed of Marcou's Comet Creek Cretaceous *G. pitcheri* (*G. navia*, Hall), and are far above the base of the other fossiliferous beds of the Comanche Cretaceous.

Furthermore, while the two species of Gryphæa described by Professor Marcou from Comet Creek, Oklahoma, and Tucumcari, New Mexico, respectively (the former as Cretaceous and the latter as Jurassic), are both now known to occur in the Washita division of the Lower Cretaceous series, there is much stratigraphic evidence indicating that the alleged "Jurassic" form occupies a horizon slightly higher than that of the other species, which he called Cretaceous, although two forms are sometimes associated together.[4]. The latter, in the main area of the Cretaceous where the section is complete, has a unique and persistent hemera in the Kiamitia beds at the base of the Washita division. The varieties of *G. corrugata* Say, called by Marcou *G. tucumcarii*, etc., found in the Tucumcari beds of New Mexico and in the outlying areas of the Comanche series in Oklahoma and southern Kansas, are associated with a molluscan fauna which belongs higher up in the Washita division.[5]

Reviewing the criticisms of Professor Marcou's work and species in the light of years of later observation, it is but justice to say that mistakes were made by both sides engaging in the discussion. Professor Marcou's assignment of the Tucumcari beds to the Jurassic was erroneous, and his antagonists' assignments of them to the Cretaceous were correct, but erroneous in referring to the Upper or Meek and Hayden section of the Cretaceous. They are now known to be Lower Cretaceous, lying just midway between the horizons fixed by the parties to the controversy.

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[1] Science, July 17, 1896. Also Am. Jour. Sci., 3d series, Vol. L, 1895, pp. 229-233.

[2] See outlying areas of the Comanche series: Am. Jour. Sci., 3d series, Vol. L, 1895, pp. 229-233.

[3] In November, 1896, Mr. Vaughan visited the region west of Arapaho, "G" County, Oklahoma, and endeavored to locate Professor Marcou's Comet Creek locality. The name Comet Creek is unknown to the present inhabitants, but beds were found which clearly conform to Professor Marcou's description. See Am. Jour. Sci., July, 1897, pp. 43-50.

[4] See Am. Jour. Sci., Sept., 1895, pp. 205-234, and July, 1897, p. 50.

[5] See Am. Jour. Sci., Sept., 1895, pp. 205-234.

Professor Marcou's opponents correlated all of what is at present known as the Lower Cretaceous (Comanche series) with the Upper Cretaceous, and mixed the fossils from widely separated formations, now known never to occur together, such as *Gryphæa pitcheri* (of the Washita division) with *Ammonites texanus* (of the Niobrara), and *Inoceramus problematicus* (of the Benton) with *Holectypus planatus* (of the Fort Worth).[1] These were mistakes similar to those which Professor Marcou was supposed to have made.

The age of the Tucumcari beds has been determined to be Cretaceous in the light of more careful investigations made since Professor Marcou's hasty visit, upon the following evidence:

1. Professor Marcou, whose expedition permitted only a hasty examination, found but two species in the Tucumcari beds, and both of these were fossil oysters. More detailed recent investigations have shown, in addition to these, a large molluscan fauna of many species having greater value for correlation purposes.

2. The position of this fauna, from a fragmentary outlier of the Cretaceous, when compared with the complete section of the main body of the Cretaceous in Texas, has been shown to be that of the uppermost beds of the Lower Cretaceous of the Texas region. It has also been shown that, while Professor Marcou's Tucumcari fossils belong to the same stratigraphic division of the Cretaceous as do those of his Comet Creek beds, which he himself has termed Cretaceous, they come from a slightly higher horizon.

3. The Tucumcari fauna has been studied minutely by those paleontologists who are most familiar with the American Cretaceous formations and has been pronounced by them to be undoubtedly Cretaceous.

4. The Tucumcari beds contain fossils which Professor Marcou himself has described as Cretaceous species in other localities.

5. The Tucumcari fauna has been carefully collected and studied by Prof. Alpheus Hyatt, who is the chief American student of Jurassic invertebrate paleontology, and compared by him with known Jurassic species of other localities in this country and in Europe, and his verdict, as given in the following extract from one of his unpublished manuscripts in our possession on the age of the Tucumcari beds, is that he does not find a single Jurassic species in it:

> The following notes on the species found in the Tucumcari series of San Miguel County, N. Mex., are very imperfect. They are for the most part comparisons between the fossils found at Tucumcari and elsewhere with European Upper

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[1] See observations on the Cretaceous strata of the United States with reference to the relative position of fossils collected by the Boundary Commission, by James Hall: Am. Jour. Sci., 3d series, Vol. XXIV, 1857, pp. 72–86.

Jurassic forms. My comparisons did not extend into the Cretaceous except in the case of the Trigonia, Ostrea, and Ammonites, which did not appear to have any close affinities in the Jura. If the work had not been interrupted by Congressional action in 1892, the comparisons would have been extended into the Cretaceous and also to those said to be the same by American authors. As the matter now stands, I have no opinion with regard to the age of these rocks further than what is expressed in this negative fact and in the positive results attained by the examinations of *Schloenbachia shumardi* and *Gryphæa tucumcarii*, both of which have the characteristics of Cretacic types.

It will be seen that I did not succeed in finding identical species in the European Jura. When the ostreas were being studied I found great confusion, and not having ample American materials, I determined to revise the whole group, and have added in Appendix A descriptions of the principal European and American species of the Jura and *vesicularis* of the Cretaceous. The object in point in this research was the finding of some characteristic which could be used to distinguish Cretacic from Jurassic species. This finally appeared in the peculiar crenulations on either side of the hinge line. These crenulations made by the border of the mantle have not yet been found, so far as I know, in any Jurassic species. The collections of this group are large in the Museum of Comparative Zoology, and both these and approximately all published figures by different authors were carefully examined. *Gryphæa tucumcarii* has these crenulations in common with all other American and European Cretacic species.

Having been requested to make an examination of the species of Ammonitidæ found at Tucumcari and compare it with *Ammonites shumardi* Marcou, I did this work carefully, and arrived at the conclusion that the two were identical. The young of *shumardi* have bifurcated costæ with huge tubercles on the umbilical shoulders and another row of smaller ones on the geniculæ. In well-preserved fossils an inner line of tubercles begins to make its appearance in some specimens, and these may possibly be distinct from some others in which they appear later in the life of the shell. The bifurcated costæ alternate with single costæ that do not usually reach internally to the umbilical shoulders, and these single costæ have only the outer row or rows of tubercles. The alternation of the costæ may be regular or irregular, but is evidently characteristic, being found in all well-preserved specimens from New Mexico and Texas that I have seen, and also appearing in Professor Marcou's figures of this species in his Geology of North America. In the next stage, the adult, which is reached in Marcou's specimen, according to his figure, only on the last quarter of the outer volution, the bifurcated costæ separate gradually into single costations. This separation, which makes an additional number of single costæ at this stage of growth, becomes quite perfect in some large specimens.

The keel is well preserved on casts, but is narrow, very prominent, and smooth, the outline of the exterior being entire and not crenulated or influenced in any way by the costæ. These last pass well up on the venter, and are very tumid and broad, and are either straight or very slightly bent, but invariably disappear at the base of the keel.

The old whorl of *shumardi* is not unlike *Ammonites leonensis* of Conrad;[1] and might be mistaken for it if a fragment of the cast of a senile volution were found which was not very well preserved and had lost the second row of tubercles, but in well-preserved specimens they are apparently easily separated. There are no species in the Jura, so far as I know, that approximate to *Ammonites shumardi*. It belongs to the well-characterized Cretacic division of the genus Schloenbachia, usually called the Inflatus group.

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[1] Description of Cretaceous and Tertiary fossils: U. S. and Mex. Boundary Survey, Vol. I, Part II, p. 160, Pl. XVI, fig. 2*a*.

The misunderstandings that have surrounded the species have been augmented by misfortunes in the preservation of the original type specimens upon which it was founded. The types of Say's description are lost, although they may yet be rediscovered in the Philadelphia collections. That of Morton's was originally deposited in the collections of the Academy of Natural Science at Philadelphia, but was misplaced or lost, so that until the present day it has been inaccessible to all, with two exceptions, of those who have contributed to the literature concerning it. At the date of this publication it is in the collections of the University of Texas, Austin, Texas.

The first confusion arising from the inadequate preservation of this type specimen is seen in the writings of Dr. Ferdinand Roemer. In the year 1847 he visited Philadelphia to see the types of Morton's original species, in order to compare them with some forms he himself had found near New Braunfels and other points in Texas. Concerning these types he wrote:[1]

> I would never have recognized from Morton's insufficient figure, which represents a small form or a young specimen, that the large canoe-shaped, arched specimens from Texas belong to this species, if I had not seen in the Museum of the "Academy of Natural Sciences" in Philadelphia specimens determined by Morton himself which agree completely with those from Texas. Morton furthermore remarks[2] in the description of the species that he possessed specimens almost 3 inches in length.

Thus, by the erroneous impression given to Dr. Roemer, through the careless preservation of original type specimens, the first confusion of Morton's *G. pitcheri* with the other species of Gryphæa was started and the nucleus was created for an almost endless misrepresentation and confusion of forms, which has so permeated all the literature of the country that the task of correcting it has at times seemed almost impossible. Mr. W. M. Gabb, who was at one time curator of the Philadelphia collections, later clearly showed the lamentable confusion of these types and how in later years the original was rescued from oblivion. Concerning them he said:[3]

> One of the principal reasons for this is the fact that Dr. Morton described the species from a very small specimen and gave in his "Synopsis" but a single figure, which was not over characteristic. Dr. Roemer, after studying the fossils of Texas, visited the museum of the Philadelphia Academy to study Morton's types, but did not succeed in finding the original specimen of this species, it having been carelessly thrown aside in a drawer full of duplicates and worthless fragments, from which I had the good fortune to disinter it in 1860 or 1861, after years of concealment. Failing to obtain more reliable information than that furnished by Morton's short description and only passable figure, Dr. Roemer applied the name to a form very common in Texas, but which, as will be seen below, I believe to be distinct from the true *pitcheri*.

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[1] Kreidebildungen von Texas, pp. 73-74; also noted in "Texas, mit besonderer Rücksicht," etc., p. 395, Bonn, 1849.

[2] Op. cit., p. 85.

[3] Palæontology of California, Vol. II, p. 272.

Professor Marcou has also noted that he has never seen the types of Morton's species,[1] and that his determination was based upon Dr. Roemer's figures.

In 1887 the senior author visited the Philadelphia Academy upon the same mission, and was shown a few specimens in a tray, including the form described by Dr. Roemer, mixed with others, but found nothing resembling Morton's figure, and departed with the same impression previously made on Roemer. Professor Heilprin, the curator, was absent during this visit, but a few days later a letter was received from his assistant stating that Morton's types had not been seen.

On the 21st day of July, 1894, the senior author once more visited the Philadelphia collections in order to see Morton's type of *G. pitcheri*, but was informed that it had been loaned to persons in Texas. More than a year later it was ascertained that Prof. F. W. Simonds, of the University of Texas, had been permitted to make some plaster casts thereof. Through his kindness we procured one of these casts, showing in exquisite perfection every detail of the original specimen, and thus for the first time an opportunity was obtained to form a correct conclusion as to its nature, and to present from these casts good and intelligible figures of the original *G. pitcheri* Morton. These figures are given in Plate VI, figs. 5 and 6, of this paper.

THE FOSSIL OYSTERS OF THE TEXAS REGION.

While this paper is devoted to the particular group of forms which have been referred to *Gryphæa pitcheri* Morton, it is necessary, before proceeding further, to make a few general remarks upon the fossil Ostreidæ of the Texas region.

The quantity and perfect preservation of the shells of fossil oysters in the Cretaceous formations of Texas excite the interest and curiosity of all who have visited that region. In places these shells weather out of the chalk or marly clay, representing the ancient sea sediments in which they were originally embedded, and lie strewn upon the surface in such great numbers that they are sometimes used for road material or collected and burned into lime. At other places extensive masses of indurated strata, the outcrop of which can be traced for many miles, are composed entirely of them. The pebble of every stream bed is made up largely of them, and they are even found as redeposits in later formations.

Catlin, the painter of Indian portraits, thus describes "a ridge of fossil shells" near old Fort Washita, Indian Territory, which is composed of one of the species commonly called *Gryphæa pitcheri*:

> One of the most curious places we met in all our route was a mountain ridge of fossil shells, from which a great number of the above-mentioned specimens were taken. During our second day's march from the mouth of the False Washita

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[1] Proc. Boston Soc. Nat. His., Vol. VIII, 1852, p. 95.

> we were astonished to find ourselves traveling over a bed of clam and oyster shells, which were all in a complete state of petrification. This ridge, which seemed to run from the northeast to southwest, was several hundred [?] feet high, and, varying from a quarter to half a mile in breadth, seemed to be composed of nothing but a concretion of shells, which, on the surface exposed to the weather for the depth of 8 or 10 inches, were entirely separated from the cementing material which had held them together, and were lying on the surface, sometimes for acres together, without a particle of soil or grass upon them, with the color, shapes, and appearance exactly of the natural shells lying loosely together, into which our horses' feet were sinking at every step above their fetlocks. These I consider the most extraordinary petrifactions I ever beheld. In any way they could be seen, individually or in a mass together, they seemed to be nothing but the pure shells themselves, both in color and in shape. . . . . . . This remarkable ridge is in some parts covered with grass, but generally with mere scattering bunches for miles together, partially covering this compact mass of shells, forming, in my opinion, one of the greatest geological curiosities now to be seen in this country, as it lies evidently some thousands of feet above the level of the ocean and 700 or 800 miles from the nearest point on the seacoast.[1]

The fossil oysters of the Texas region belong to many genera and species, embracing a great variety of size and form, from the minute *Exogyra arietina*, less than an inch in length, to the gigantic *Exogyra ponderosa*, individual shells of which weigh 5 pounds or more. They are found at various horizons throughout the 4,000 or more feet of rocks constituting the thickness of the Cretaceous strata of central Texas.

CLASSIFICATION OF THE OSTREIDÆ.

In undertaking the study of the Ostreidæ, one is soon confronted with the question, What constitutes species and genera in this group? The variation of species is much greater in the Ostreidæ than in other molluscan genera. No other group presents such unsatisfactory criteria for specific differentiation. These forms, judging from their stratigraphic occurrence as well as their habits, seem to adopt new variations of shape with every change in physical condition of habitat, as is illustrated in the variations of our living species. Changes similar to those occurring at the present time have occurred in the past, and no doubt many species have arisen by some of these local variations becoming fixed and persistent. Large suites of specimens often show that two species usually considered very distinct may grade into each other. The intergradations are of such a kind that frequently it can easily be shown that the two species have been derived from a common ancestor; in other cases one species is evidently derived from another occurring stratigraphically below it.

In the genus Ostrea proper it is a well-known fact that certain shapes recur in widely separated geologic horizons and are apparently missing in the intervening strata. Thus some of the normal ostreas of the Trinity and other beds of the Cretaceous and of the Eocene bear so great a resemblance in shape to forms of the living *O. virginiana* that one can only with great difficulty describe their difference, yet if a full suite of each species should be collected its ensemble would have an individuality that would be unmistakable.

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[1] From the Catlin Indian Gallery in the United States National Museum, by Thomas Donaldson: Smithsonian Report, 1886, p. 490.

Nearly all of the species of fossil oysters have been founded upon adult forms, without knowledge of the life history of the individual, so ably worked out in some cases by Ryder and Jackson. It is regrettable that full suites of specimens representing all the species hitherto described have not been studied after these modern methods, and in in this paper the endeavor will be made to point out the morphologic development of the particular species chosen for discussion.

Accepted authorities have stated that variation is so great in fossil oysters as to make specific differentiation difficult, thereby rendering them of little value as stratigraphic criteria. The observations of the writers of this paper have led to quite the opposite conclusion, namely, that certain forms of the Ostreidæ possess very distinct specific characters, have definite geologic horizons, and are of the greatest value in stratigraphic work.

While some species of the genus Ostrea proper may be of little value in stratigraphic determination, species of other genera appear and disappear in relation to the sequence or beds with great certainty. For instance, in the Texas region there are no more positive or persistent criteria of exact stratigraphic position than such forms as *E. arietina*, *O. lugubris*, *O. quadriplicata*, *O. carinata*, *and O. diluviana*, while other forms, such as *E. costata* and *G. vesicularis* have their hemeræ coincident with certain divisions or groups of beds. No other fossil mollusks are so numerous or so favorably preserved for study. Some have considerable vertical range and variation, while others, like *Exogyra arietina* Roemer, appear by millions in a single definite stratigraphic horizon only. The stratigraphic occurrence of all the species, so far as known, is shown on Pl. XXXIV.

The majority of paleontologists are agreed that four broad divisions of the Ostreidæ may be recognized, to wit: Ostrea, Alectryonia, Exogyra, and Gryphæa. A considerable number of other generic or subgeneric names have been proposed, as Amphidonta, Liogryphæa, Pycnodonta, and Gryphæostrea. Bayle has gone further than any other student of these forms and has used[1] the names Actinostreon, Ceratostreon, Rhyncostreon, and Aetostreon, for specimens figured, but has never published any descriptions.

In our opinion no one of the proposed classifications is entirely satisfactory. Probably none can be proposed until the whole group, both the fossil and the recent Ostreidæ, has been the subject of thorough investigation from a phylogenetic and morphologic standpoint, according to the lines of research followed out by Hyatt in the cephalopods, Jackson in the pelecypods, Beecher and Schuchert in the brachiopods, and Von Koch in the stony corals. It is very evident that some of the groups are in no sense natural—Alectryonia, for instance, in which are forms that have entirely different phylogenetic histories. Some forms, such as the *Ostrea quadriplicata* of Shumard and the *O. crenulimargo* of Roemer, will not adapt themselves to any of the proposed classifications.

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[1] Carte géologique de la France. IV, Atlas, 1878.

While not proposing new generic terms of classification in the list of Texas species herewith given, the various forms may be provisionally classified into certain groups, as follows:

Genus OSTREA Linnæus, 1758.

a. Ostrea s. s. Type, *O. edulis* Linné. Represented by the ordinary recent oysters.

b. Alectryonia, 1807. Type, *O. crista-galli*, Linn. The type has both valves radiately plicate and sends out from the lower valves processes that aid in its attachment. The generic names Lopha of Bolten, Dendrostrea of Swainson, and Actinostreon of Bayle are synonyms of Alectryonia. The radiately plicate forms have the plications in some species confined to the lower valve; in others, both valves are plicate.

b. 1. The above-described types grade into the forms represented by *Alectryonia carinata* Lam., *A. larva* Goldfuss, *A. frons* Parkinson, etc., in which the plication diverges from a medium carina.

b. 2. Quadriplicate forms. Plicated forms tending toward extreme unilateral expansion, producing a lateral elongation at right angles to the antero-postero axis of the shell, contrary to the general rule, whereby most of the oysters have their greatest length parallel to this axis. Example, *Ostrea quadriplicata* Shumard.

Genus EXOGYRA Say, 1820.

a. Exogyra s. s. Type, *E. costata* Say. Obese or craniate forms, in which the valves are rounded and are excessively thick in the region near the beak, which often has a tendency to coil perpendicularly to the shell and free from it. Examples: *E. costata* Say, *E. ponderosa* Roemer, *E. læviuscula* Roemer, *E. arietina* Roemer; and probably *E. plexa* Cragin should be included in the same category.

b. Ceratostreon Bayle, 1878. Types, *E. flabellata* and *E. matheroni*. Auriculate or flattened forms, in which the upper valves have very flat or concave surfaces; usually there is a rather sharp angle or carina near the convex margin of the shell; the umbones are relatively small, compressed, flattened against the shell and attached thereto. Example, *E. texana* Roemer and its various varieties, *E. americana* Marcou.[1]

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[1] *E. sinuata* var. *americana* Marcou.

Bayle has used two other names: Rhyncostreon, to include those forms like *E. columba* Lam.; and Aetostreon for those like *O. latissima* Lam. and *O. couloni* Defrance. No forms belonging to the Aetostreon division have been found in Texas.

Genus GRYPHÆA Lamarck, 1801.

a. Paul Fischer defines Gryphæa s. s. as follows: "Bord des valves ondulé; surface plissée plus ou moins."[1] Lamarck described the genus Gryphæa in his Histoire Naturelle des Animaux sans Vertèbres (2d ed.), Vol. VII, 1836 (original date 1801), p. 201, as follows: "Coquille libre, inéquivalve; la valve inférieure grande, courbée, concave, terminée par un crochet saillant, courbé en spirale involute; la valve supérieure petite plane et operculiforme.

"Charnière sans dents; une fossette cardinale; oblongue, arquée. Une seule impression musculaire sur chaque valve.

"Animal inconnu."

He mentions as examples on succeeding pages *G. angulata*, *G. cymbium*, *G. arcuata*, *G. secunda*, *G. lituola*, *G. latissima*, *G. plicata*, etc., thirty-four in all. There are included in the list both what we now understand by Gryphæa and by Exogyra. The first species mentioned, *G. angulata*, after an examination of specimens in the United States National Museum, appears to the authors to be a radiately plicate true oyster. Lamarck specified no species as a type. De Blainville, in his Manual de Conchyliologie, Strasbourg, 1825, page 522, appears to be the first to fix the type. His description is as follows:

> Animal entièrement inconnu.
>
> Coquille plus finement lamelleuse que celles des huîtres, libre ou peu adhérente subéquilatérale très-inequivalve; la valve inférieure très-concave, à sommet plus ou moins recourbé en crochet; la supérieure operculiforme, et beaucoup plus petite; charnière édentule; ligament inséré dans une fossette alongée et arquée; une seule impression musculaire, comme dans les huîtres.
>
> A. Espèces dont le sommet de la valve est subvoluté.
>
> Ex. La Gryphée gondole, *Gryphœa cymbium*, E. m., pl. 189, fig. 1-2, la *G. arquée*, *G. arcuata*, Pl. LIX, fig. 3 [should be 4].
>
> B. Espèces dont le sommet de la valve inférieure n'est pas voluté.
>
> Ex. La G. podopsidée, *G. podopsidea.*
>
> Observ. On ne connoît encore qu'un espèce vivant dans la première division de ce genre. M. Defrance en compte vingt espèces fossiles et paroît beaucoup douter de l'existence de l'espèce vivante. . . .

Here we have a figured type, *G. arcuata*, and this, in the writer's opinion, must be the type of the genus Gryphæa. Examples: *G. marcoui*, *G. corrugata*, *G. navia*, *G. mucronata*. *G. arcuata* is also the type of Paul Fischer's section Liogryphæa, 1886: Manuel de conchyliologie, p. 927.

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[1] Man. de Conchyliologie, 1887, p. 927.

b. Pycnodonta, Fischer von Waldheim: Bull. Soc. imp. des naturalistes de Moscou, Vol. VIII, 1835, p. 118.

The date is sometimes given as 1834, sometimes as 1835. The original description is in a letter from Fischer von Waldheim to Férussac, dated December 12, 1834, but published in 1835 in the journal already mentioned.

This name was proposed for *Gryphæa vesicularis*. The form is hemispherate; the apical or beak is proportionately less conspicuous and the shell thinner than in the Gryphæa s. s.

Examples: *G. vesicularis*, the type, and *G. washitænsis* Hill.

Genus GRYPHÆOSTREA Conrad.[1]

We copy the following from Meek's Invertebrate Cretaceous and Tertiary Fossils of the Upper Missouri Country.[2]

> Shell thin, elongate, straight narrow: lower valve rather deep and smooth; upper valve flat or slightly concave; and ornamented with distant, regular, thin, concentric laminæ: beak of lower valve contorted, or turned to one side; cartilage-pit narrow, oblique. *Gryphæa vomer* Morton (sp.).

In a footnote appended to the foregoing Meek says:

> Mr. Conrad did not publish a diagnosis of this type, but merely gave the name in a list of fossils. At my request, however, he gave me in manuscript the above diagnosis and mentioned the above type. I would add that in perfectly preserved specimens the typical species presents the singular peculiarity of throwing out long. slender, auricular appendages (one on each side) from the lower valve near the beak. These, being very fragile, are nearly always broken away, as the specimens are found; but I observed several with more or less of them preserved in the New Jersey beds, and one I found growing in the inside of a *Gryphæa vesicularis* with them perfectly preserved and apparently attached to the Gryphæa by their extremities. This type or section might with almost equal propriety be placed as a subgenus of Exogyra.

ACCEPTED SPECIES.

Following is a list of all the known described species of fossil oysters from the Cretaceous formations of Texas, and such data concerning their geologic horizons and geographic distribution as the authors have been able to acquire from many years' experience in observing these forms.

Ostrea, Normal forms.
    O. bella Con.
    O. camelina Cragin.
    O. carica Cragin.
    O. congesta Con.
    O. cortex Con.
    O. franklini Coq.
    O. franklini Cragin.
    O. franklini var. ragsdalei Hill.

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[1] Am. Jour. Conchol., Vol. I, 1865, p. 15.

[2] Rept. U. S. Geol. and Geog. Surv. Terr., Vol. IX, 1876, p. 11.

Ostrea, Normal forms—Continued.
- O. lyoni Shum.
- O. owenana Shum.
- O. perversa Cragin.
- O. planovata Shum.
- O. plumosa Mort.
- O. pseudo-franklini Coq.
- O. soleniscus Meek.
- O. subspatulata Forbes.
- O. vellicata Con.

Alectryonia.
- O. alifera Cragin.
- O. alifera var. pediformis, Cragin.
- O. alternans Cragin.
- O. diluviana Lamck. White.
- O. lugubris Conrad.
- O. panda Morton.
- O. subovata Shum.
- O. ?munsoni Hill.
- O. quadriplicata Shum.
- O. crenulimargo Roemer.
- O. crenulimargo stonewallensis Cragin.
- O. larva.
- O. carinata.

Exogyra.

Exogyra s. s.
- E. arietina Roemer.
- E. colombella Meek.
- E. plexa Cragin.
- E. costata Say.
- E. drakei Cragin.
- E. ferox Cragin.
- E. læviuscula Roemer.
- E. ponderosa Roemer.
- E. n. sp., Shoal Creek.
  - E. n. sp., from El Paso, Texas.

Ceratostreon, Bayle.
- E. americana Marcou.
- E. Americana var. quitmanensis Cragin.
- E. hilli Cragin.
- E. texana Roemer.
- E. texana var. fragosa Conrad.
- E. weatherfordensis Cragin.
- E. texana var. hilli.

Rhyncostreon Bayle.
- E. columbella Meek.

Gryphæa.

Pycnodonta.
- G. vesicularis Lamck.
- G. aucella Roemer.
- G. newberryi Stanton.
- G. washitaensis Hill.
- G. gibberosa Cragin.

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	Lower Cretaceous.								Upper Cretaceous.					
	Trinity.	Glen Rose.	Paluxy.	Walnut.	Comanche Peak-Edwards.	Preston.	Forth Worth.	Denison.	Lower Cross Timbers.	Eagle Ford.	Austin.	Taylor.	Uppermost division.	Horizon unknown.
NORMAL OSTREA.														
O. bella Con														×
O. cortex Con													×	
O. vellicata Con													×	
O. subspatulata Con														×
O. owenana Shum													×	
O. planovata Shum												×	×	
O. congesta Con										×				
O. carica Crag									×					
O. lyoni Shum									×					
O. soleniscus Meek									×					
O. perversa Crag								×						
O. pseudo-franklini Coq						×								
O. franklini Coq	×	×												
O. franklini var. camelinas Crag		×												
O. franklini var. hilli Crag		×												
O. ragsdalei Hill		×												
ALECTRYONIA.														
O. diluviana Lamck. White												×		
O. lugubris Con										×				
O. subovata Shum					?		×	?						
O. ? munsoni Hill					×									
O. panda												×		
O. quadriplicata Shum								×						
O. crenulimargo Roemer			×											
O. larva Goldfuss													×	
O. carinata Lamck								×						
GRYPHÆA.														
G. vesicularis Lamck												×	×	
G. vomer Morton													×	
G. aucella Roemer											×			
G. newberryi Stanton											×			
G. washitaensis Hill						×	×	×						
G. corrugata Say						×								
G. navia Hall						×								
G. marcoui H. & V				×	×									
G. wardi H. & V		×												
EXOGYRA.														
E. arietina Roemer								×						
E. plexa Cragin						×								
E. costata Say													×	
E. ponderosa Roemer											×	×		
E. laeviscula Roemer											×			
E. columbella Meek										×				
E. ferox Cragin									×					
E. drakei Cragin								×						
E. arietina Roemer								×						
E. plexa Cragin						×								
E. americana Marcou						×	×	×						
E. texana Roemer		×		×	×	×								
E. texana var. fragosa Con						×								
E. texana var. weatherfordensis Crag		×												
E. texana var. hillii Crag		×												

Gryphæa—Continued.
  Liogryphæa.
    G. mucronata Gabb.
    G. corrugata Say.
    G. corrugata var. belviderensis Cragin.
    G. hilli Cragin.
    G. navia Hall.
    G. marcoui H. and V.
    G. wardi H. and V.
  Gryphæostrea.
    G. vomer Morton.

INDEFINITE AND ABANDONED SPECIES.

The following species have also been reported, but are for the present considered invalid, owing to the fact that they are too poorly described to be recognized:

Ostrea roanokensis Cragin.
Exogyra fimbriata Con.
Exogyra paupercula Cragin.

The following names are abandoned:

Ostrea anomiæformis Roemer, belongs to the genus Anomia.
Ostrea blacki White, O. alifera Cragin, O. alifera var. pediformis Cragin. and O. belliplicata Shum. = O. lugubris Con.
Ostrea camelina Cragin = O. franklini Coq.
O. franklini Cragin (not Coq.) = undescribed species.
O. franklini var. ragsdalei Hill=O. ragsdalei Hill.
Exogyra sinuata Cragin.
Exogyra walkeri White = E. americana Marcou.
Exogyra weatherfordensis Cragin = E. texana var. weatherfordensis.
Exogyra hilli Cragin = E. texana var.
Exogyra caprina Con. = E. arietina Roemer.
Exogyra fragosa Con. = E. texana var.
Ostrea marshi Marcou (not Sowerby) = O. subovata Shumard.
Gryphæa pitcheri of Morton, Hall, Shumard, Roemer, White, et al = G. corrugata, Say.
Exogyra forniculata White = G. navia Hall.
G. gibberosa Cragin = G. washitaensis Hill.
G. tucumcarii Marcou = G. corrugata Say.
G. hilli Cragin is reduced to varietal rank as G. corrugata var. hilli.

Each of these different species occupies a definite horizon or range (hemera), so that they become valuable landmarks in determining the exact geologic position of the beds in which they occur in the general series of rocks, thus giving important data for estimating the depth of certain water-bearing strata in the artesian areas of Texas. The geologic position and range of the various species are shown in the accompanying table (p. 31) and plate (Pl. XXIV).

	Lower Cretaceous.								Upper Cretaceous.					
	Trinity.	Glen Rose.	Paluxy.	Walnut.	Comanche Peak-Edwards.	Preston.	Forth Worth.	Denison.	Lower Cross Timbers.	Eagle Ford.	Austin.	Taylor.	Uppermost division.	Horizon unknown.
NORMAL OSTREA.														
O. bella Con														×
O. cortex Con													×	
O. vellicata Con													×	
O. subspatulata Con														×
O. owenana Shum													×	
O. planovata Shum												×	×	
O. congesta Con										×				
O. carica Crag									×					
O. lyoni Shum									×					
O. soleniscus Meek									×					
O. perversa Crag								×						
O. pseudo-franklini Coq						×								
O. franklini Coq	×	×												
O. franklini var. camelinas Crag		×												
O. franklini var. hilli Crag		×												
O. ragsdalei Hill		×												
ALECTRYONIA.														
O. diluviana Lamck. White												×		
O. lugubris Con										×				
O. subovata Shum					?		×	?						
O. ? munsoni Hill					×									
O. panda												×		
O. quadriplicata Shum								×						
O. crenulimargo Roemer			×											
O. larva Goldfuss													×	
O. carinata Lamck								×						
GRYPHÆA.														
G. vesicularis Lamck												×	×	
G. vomer Morton													×	
G. aucella Roemer											×			
G. newberryi Stanton											×			
G. washitaensis Hill						×	×	×						
G. corrugata Say						×								
G. navia Hall						×								
G. marcoui H. & V				×	×									
G. wardi H. & V		×												
EXOGYRA.														
E. arietina Roemer								×						
E. plexa Cragin						×								
E. costata Say													×	
E. ponderosa Roemer											×	×		
E. laeviscula Roemer											×			
E. columbella Meek										×				
E. ferox Cragin									×					
E. drakei Cragin								×						
E. arietina Roemer								×						
E. plexa Cragin						×								
E. americana Marcou						×	×	×						
E. texana Roemer		×		×	×	×								
E. texana var. fragosa Con						×								
E. texana var. weatherfordensis Crag		×												
E. texana var. hillii Crag		×												

In examining the foregoing table and Pl. XXXV, one is impressed with the hemeras or ranges of the various groups. The genus Ostrea, which had its origin before the Cretaceous, probably in Carboniferous time, continues with local and horizontal variations through the Cretaceous.

The alectryoniate oysters likewise have an extensive range, and are no doubt descended from Jurassic forms. The *O. carinata* type, however, appears in one horizon of the Lower Cretaceous (Upper Comanche), and is not present again until *O. larva* occurs in the uppermost Cretaceous.

The particular *O. quadriplicata* group has only a limited range, the two species *O. quadriplicata* Shumard and *O. crenulimargo* being confined to the Comanche series, and no intermediate forms occur indicating its ancestry.

Among the gryphæas those of the Lower Cretaceous, with one exception (*G. washitaensis*), are confined to the thick-shelled species of the *G. corrugata* type, and there is no doubt that these are differentiated from some common ancestral form of the Jurassic, probably closely related to *G. calceola* var. *nebrascensis*. The thin-shelled (Pycnodonta) type has a faint representation in the upper part of the Lower Cretaceous, in *G. washitaensis*, but occurs in greatest abundance as the type of Gryphæa in the Upper Cretaceous, from which the thick-shelled species are missing.

The Gryphæostrea is not represented in the Lower Cretaceous, so far as we know.

In the exogyras the hemera of the flat-ear-shaped (Ceratostreon) group of the *E. texana* type is confined to the Lower Cretaceous. *E. texana* is a highly differentiated form, and must have had an ancestry as yet unknown. It is interesting to note that the two well-marked groups of Exogyra have different and succeeding hemeras. The flattened exogyras are succeeded in the Middle and Upper Cretaceous by the deeply arched, long-beaked, thick-shelled species of the *E. ponderosa* type, of which *E. plexa* and *E. arietina* are the ancestral forms.

It would be impossible from the American Cretaceous forms alone to construct a family tree showing the evolution of all species. In the first place, we have in this country no Jurassic fossils of the antecedent Atlantic sedimentation, and inasmuch as the prototypes from which much of the differentiation proceeded must have existed in that period, our record is incomplete.[1]

Again, some of the forms, like *Gryphæa vesicularis*, *Ostrea carinata*, and many others, have trans-Atlantic occurrences, and there is no reason to assume that they originated in the Texas region. They may or may not be immigrants from distant loci of origin and descendants of ancestral forms not represented in the Texas sediments.

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[1] Since this paper was written Jurassic sediments with fossil Ostreidæ have been discovered in Trans-Pecos Texas, on the western or interior side of the Codilleran front. Further studies may give important light on the points discussed.

HISTORICAL STATEMENT OF THE DISCOVERY IN THE TEXAS REGION OF THE FORMS REFERRED TO GRYPHÆA PITCHERI MORTON.

GRYPHÆA CORRUGATA Say, 1823.

The first description from the Texas-Indian Territory region of any of the group of gryphæate oysters, now commonly but erroneously referred to *G. pitcheri* Morton was based upon material collected in southern Indian Territory by Mr. Thomas Nuttall, described by Say, and published in James's account of Major Long's expedition.[1]

The specimens described were found by Nuttall, the botanist, on the prairie bordering the Kiamitia River, near its confluence with Red River. From the writings of that traveler we learn that in 1819 he also traversed the narrow area of Texas-like prairie lands adjacent to the Kiamitia River, lying south of the Ouachita Mountains and north of Red River, in southern Choctaw Nation, a region concerning the stratigraphy of which little further has been known until the senior author's studies and explorations of recent years.[2]

Although it is not clear from the records that Major Long collected any fossils from the region, he was the first, in 1817, to explore the Kiamitia River from its source to its mouth, and first noted the extensive prairies on the lower part of that stream, "some of which," he says, "command delightful views of the country." He continues, "before you lies the great valley of Red River, exhibiting a pleasing variety of forests and lawn; beyond are the summits of the Ozark Mountains, imprinting their broad outline upon the margin of the sky." Then he describes the area where the characteristic prairies of the Texas region, underlain by the Cretaceous formations, abut against the Paleozoic rocks, the latter projecting above them as the mountains of Indian Territory.

Nuttall traversed the same region in 1819 and described it more minutely.[3] From his description (and the senior author has visited nearly every locality he describes in his report) one is impressed with the acuteness and accuracy of his observations.

Nuttall thus describes the prairie of the Kiamitia, from which these fossils were collected:[4]

> The surface of these woodless expanses was gently undulated and thickly covered with grass knee-high, even to the summits of the hills, offering an almost

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[1] Account of an expedition from Pittsburg to the Rocky Mountains, performed in the years 1819-20, under the command of Maj. Stephen H. Long, compiled by Edwin James, Philadelphia, 1823, Vol. II, pp. 410-411.

[2] Neozoic geology of Southwest Arkansas: Ann. Rept. Geol. Survey Arkansas, Vol. II, Little Rock, 1888. The Comanche series of the Texas-Arkansas region: Bull. Geol. Soc. America, Vol. II, 1891, pp. 503-528. Geology of portions of Texas and Indian Territory adjacent to Red River: Bull. Geol. Soc. America, Vol. V, 1894, pp. 297-338. Outlying areas of the Comanche series: Am. Jour. Sci., 3d series, Vol. L, 1895, pp. 205-234.

[3] Travels into the Arkansa Territory during the Year 1819, Philadelphia, 1821. Although Nuttall's explorations were made after Major Long's, the report of his expedition was published two years earlier than the latter's.

[4] Ibid., pp. 156-157.

> inexhaustible range to cattle. The flowers, which beautify them at this season of nature's vigor, communicated all the appearance of a magnificent garden fantastically decked with innumerable flowers of the most splendid hues. The soil appears to be universally calcareous, with the limestone nearly white and full of shells, among which there was abundance of a small species of gryphite, and in the more compact beds some species of terebratulites.[1] This calcareous rock, different from the Mountain limestone, often contains uncemented or loose shells immersed in beds of friable clay, and is more analogous to that of South Carolina and Georgia than that of St. Louis and the Ohio.

The small species of "gryphite" above mentioned was no doubt the same that Say later described, under the name *Gryphæa corrugata*, as having been collected by Nuttall. Say's original description is given in full on page 54 of this paper.

If the type of this specimen has been preserved, its existence is unknown, but the description, insufficient as it is, when supplemented by the reference to Sowerby's plate, enables one to identify the species. It is a remarkable fact, however, that this original description and specific name were soon forgotten, and from the day of their publication until the present have been overlooked. It is through the kindness of Mr. T. W. Stanton that the writer's attention has been called to this description of Say's. Within eleven years after it had been written the same species from the same general locality was redescribed under the name *Gryphæa pitcheri*, by Dr. S. G. Morton, and this name was accepted and used by most subsequent writers until the present time.

GRYPHÆA PITCHERI Morton, 1834.

Soon after the acquirement of the territory of Louisiana by the United States, and long before observations had been made on the stratigraphic geology of the Texas region, a military post was established at Fort Towson, in the southwest corner of what is now the Choctaw Nation, and in the region which had previously been reconnoitered by Long and Nuttall. Among other officers sent to this post was an army surgeon, Dr. Z. Pitcher, who, in 1833, gathered some fossil shells[2] from the vicinity and sent them to Philadelphia, where, in 1834, they were described and figured by Dr. S. G. Morton.[3]

Dr. Morton's description of the species was brief, and his illustration, an exact copy of which is reproduced on Pl. VI, fig. 7, based on the limited material which he possessed, was very poor.[4] Carefully prepared copies of the original type specimen are also reproduced on Pl. VI, figs. 5 and 6.

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[1] Kingena.

[2] For Pitcher's personal account of the collection of these shells see his letter to Captain Whipple, printed by Prof. Jules Marcou in his "Lettres sur les roches du Jura," etc., Paris 1860, pp. 291-292.

[3] Synopsis of the Organic Remains of the Cretaceous Group of the United States, Philadelphia, 1834, p. 55, Pl. XV, fig. 9.

[4] "Morton's figure of Gryphæa pitcheri (Morton), I understand, was made by Conrad"—James D. Dana; American Journal of Science, January, 1859, p. 139.

Following is an exact copy of this description:

> 4. *G. pitcheri* (S. G. M.), Pl. XV, fig. 9.
>
> *Specific character.*—Shell thick, expanded, distinctly lobed; lower valve very convex; upper valve thick and sub-convex; beak distinctly incurved.
>
> Length, one inch; but I possess less perfect specimens nearly three inches long. I received the fossil, together with some others of great interest, from my friend, Z. Pitcher, M. D., of the U. States Army, who obtained it from the plains of the Kiameshia, in Arkansas. I have seen others from the falls of Verdigris River, in the same territory.

There is no doubt, as will be shown later in this paper, that the *Graphœa pitcheri* of Morton is the same species, from the same locality, as the *Gryphœa corrugata* of Say, and hence, in the final classification, the name *Gryphœa pitcheri* is abandoned.

ROEMER'S GRYPHÆA PITCHERI, 1849.

Some fifteen years after Morton's description appeared Dr. Ferdinand Roemer made the first original paleontologic field studies in the Texas region, the scene of his investigation being near New Braunfels, some 350 miles southwest of Fort Towson. He described[1] (1849) and figured[2] (1852) from the Waco Indian camp near the Guadalupe River, 8 miles above New Braunfels, and other localities, with his customary accuracy, a beautiful gryphæa, a fossil entirely distinct from Dr. Morton's both in appearance and, as has since been discovered, in geologic occurrence.

Copies of Dr. Roemer's figures are given in Pl. XXVI, figs. 1, 2, 3. On previous pages, in the discussion concerning the preservation of the types of Morton's species, the reasons are given why Dr. Roemer correlated this form with Morton's species.

MARCOU'S GRYPHÆA PITCHERI, 1853.

In 1853 Prof. Jules Marcou, en route from Fort Smith, Arkansas, to Albuquerque, New Mexico, crossed Indian Territory along the line of the Arkansas and Canadian rivers through a region separated from the main body of the Cretaceous of Texas and southern Indian Territory by the great topographic feature of the east-west mountain ranges known as the Ouachita system. On this journey he noted two small outcrops of what are now known to be the rocks of the Comanche series, and near Comet Creek, a locality in western Oklahoma now known as "G" County,[3] where one of the outlying areas of the Comanche series occurs, he collected a form of Gryphæa (*G. navia* of Hall) to which he applied the name *G. pitcheri*. He also pointed out the occurrence of this form at Fort Washita, Indian Territory, and near Preston, Texas, from which places he had seen collections made by Dr. G. G. Shumard. This form he figured most excellently, so that it can not be mistaken. The grounds upon which he called this form *G. pitcheri* Morton were later set forth fully in another place.[1] He likewise correlated it with both Morton's and Roemer's forms, but later suggested that the latter might be a distinct species.[2] The completeness and the stratigraphic details of the Cretaceous section of the Southwest not being known at this time, naturally the horizon or true place of this form in the Texas section was not known.

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[1] Texas, mit besonderer Rücksicht auf deutsche Auswanderung, etc., Bonn, 1849.

[2] Die Kreidebildungen von Texas und ihre organische Einschlusse, Bonn, 1852.

[3] See Outlying areas of the Comanche series in Kansas, Oklahoma, and New Mexico, by R. T. Hill: Am. Jour. Sci., 3d series, Vol. L, 1895, pp. 205-234.

In 1854 Dr. Benj. F. Shumard described and figured[3] from the Cretaceous clays of Fort Washita, Indian Territory, and at "Cross Timbers, Texas," a form which is probably the same as that described by Professor Marcou.

BLAKE'S GRYPHÆA PITCHERI, 1855.

In 1855 Mr. W. P. Blake[4] described still another form of Gryphæa from Texas under the name of *Gryphæa pitcheri.* This is an important form, which was overlooked in the subsequent discussions, and which will be here alluded to as Blake's *Gryphæa pitcheri.* The type locality of this species was the Big Springs of the Colorado, and Blake's figure is the first clear illustration of the form herein designated *G. marcoui* (sp. nov.), as will be seen by a comparison of figures and by the abundant collections made from his type locality.

SCHIEL'S GRYPHÆA PITCHERI, 1855.

In the same report,[5] the same year (1855), Schiel described still another *Gryphæa pitcheri* from what is known to be the Upper Cretaceous system in New Mexico. This form has also been figured as *G. pitcheri* by White (1876).[6]

HALL'S GRYPHÆA PITCHERI, 1856 (=G. DILATATA VAR. TUCUMCARII Marcou).

Professor Marcou's collections, through official action,[7] were given to Prof. James Hall to study, and in 1856 the latter author published[8] this form as *Gryphæa pitcheri* Morton, saying: "It has clearly the typical form and characters of the species, as will be seen by referring to Dr. Morton's figure of a small individual."

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[1] Extracts of Professor Marcou's writings bearing upon this species are given on pp. 14 and 15 of this paper.

[2] Proc. Boston Soc. Nat. Hist., Vol. VIII, 1861, pp. 86-97. See quotation on p. 40.

[3] Marcy's Exploration of Red River, Washington, 1854, p. 179, Pl. VI, fig. 5.

[4] Pacific Railroad Reports, Vol. II, 1855, Pope's report on route near 32d par., The geology of the route, p. 39.

[5] Beckwith's rept. on route along 41st par., Vol. II, Chap. X, Geology, p. 108.

[6] U. S. Geog. Surv. west of One hundredth Mer., Vol. IV, 1877, p. 171, Pl. XVII, figs. 1a-1f.

[7] Geology of North America, etc., by Jules Marcou, Zurich, 1858, pp. 1-8.

[8] Pacific Railroad Reports, Vol. III, 1856, p. 100.

Professor Hall does not say that he had seen Morton's poor type specimen, a copy of the original figure of which is herein reproduced on Pl. XVI, figs. 6 and 7. Later Professor Hall, in an extended review,[1] expressed two important opinions: (1) That the specimens presented "no features, either in form, character, condition of preservation, or otherwise, which can serve to distinguish them from *Gryphæa pitcheri*" of Morton; and (2) that the beds from which these specimens came were of Cretaceous age and not Jurassic.

Professor Marcou, on his journey from Fort Smith to Alburquerque, discovered at and near Pyramid Mountain, New Mexico, 300 miles west of the locality of his *G. pitcheri*, the now famous *G. dilatata* var. *tucumcarii*, which he later figured beautifully and accurately, and which, upon grounds then apparently justifiable, he placed in the Jurassic.[2]

Professor Marcou mentioned this species several times before it was figured by himself in 1855, by Hall in 1856, and again by himself in 1858. In the first[3] of these papers he provisionally gives the form the name *Gryphæa tucumcarii.* Later he called the form *G. dilatata* var. *tucumcarii*, believing the species to be a variety of the *G. dilatata* of the European Jurassic. In 1861 he again used the name *G. tucumcarii.*

HEILPRIN'S GRYPHÆA PITCHERI, 1890.

In the years between 1886 and 1890 the senior author observed, in the Lower Cretaceous of Texas, numerous specimens of a Gryphæa (see Pls. XX–XXIII) which presented marked external difference from the forms described by previous authors. With Roemer's positive assertion in mind that his excellent figures represented the true *Gryphæa pitcheri* (as, in common with most others, he had seen the so-called type in Philadelphia), the senior author early formed the conception that if this was true the forms of *Gryphæa pitcheri* associated with *O. carinata* and with *E. arietina*, respectively, were two entirely different species.

The name *Gryphæa washitaensis* was proposed for the former, and specimens were sent to various museums, including the Philadelphia Academy of Sciences. No word was returned intimating that the determination was wrong, but within a short time Professor Heilprin published the following remarks:[4]

> *Gryphea washitaensis*, specimens of which Professor Hill has kindly sent to me, is true *G. pitcheri*, corresponding almost absolutely with the type specimen of that species (Morton's) which is contained in the collections of the Academy of Natural Sciences.

Later it will be shown that Professor Heilprin was mistaken in his identification.

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[1] Am. Jour. Sci., 2d series, Vol. XXIV, 1857, p. 85.

[2] Geology of North America, 1858, Pl. IV, figs. 1, 1a, 1b, and 3. Reproduced on Pl. XVI, this work.

[3] Résumé of a geological reconnaissance extending from Napoleon, at the junction of the Arkansas with the Mississippi, etc.: Rept. Expl. Railway Route near 35th Par., by Lieut. Whipple, pp. 40–48; Thirty-third Congress, 2d session (?), H. Doc. 129, 1855.

[4] Proc. Acad. Nat. Sci. Phila. for 1890, p. 452.

GRYPHÆA PITCHERI VAR. HILLI[1] Cragin, 1891.

Professor Cragin has reported three forms of Gryphæa from the Comanche strata of southern Kansas.[2] One of these, which he identified as *Exogyra forniculata* White, must hereafter be called *G. navia* Hall. Another well-developed species is the *G. tucumcarii* of Marcou, which has an extraordinary development.

The small specimens of *G. corrugata* found in the basal fossiliferous beds of the Belvidere, Kansas, section he has called by the name of *G. pitcheri* var. *hilli*,[3] the "hilli phase"[4] and *G. hilli*.[5] This he has alleged to be identical with the Texas form found west of Weatherford, which we herein describe as *Gryphæa marcoui* sp. nov. We have collected abundantly from both localities, and can not agree with Professor Cragin that the species are the same. Our studies show that the Belvidere specimen is merely a small varietal form of *G. corrugata* Say.

DIFFERENTIATION.

The more important facts concerning the early discovery and descriptions of forms referred to *Gryphæa pitcheri* have been briefly given.

During the decade of 1850–1860 governmental exploration of the southwestern border States and Territories was vigorously prosecuted. During this epoch occurred the extended controversy already sketched concerning the species under discussion.

Prof. James Hall made the first published intimation that the forms which had been called *G. pitcheri* were subdivisible into varieties. In his report of 1856,[6] based on Professor Marcou's collections from Indian Territory, he first suggested differentiation of the forms called *G. pitcheri* by proposing that the name "variety *navia*" be substituted for the form called *Gryphæa pitcheri* by Professor Marcou. Thus a good varietal differentiation was made, and a great advance would have been made had not Professor Hall immediately and erroneously added that this variety "is well represented in the figures of Dr. Roemer." This explains why the variety name "*navia*" in the subsequent confusion of literature became attached to Roemer's species instead of Marcou's, to which it was originally applied.

In 1857, one year later, Volume I of the United States and Mexican Boundary Report appeared, the "General Geology" of which is by Prof. James Hall, the "Tertiary and Cretaceous Paleontology" by T. A.

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[1] Am. Geologist, Vol. XIV, 1894, p. 6.

[2] See Bull. Washburn College, Vol. I, No. 9, Topeka, Kansas, January, 1889, pp. 33–36, and Vol. II, No. 11.

[3] Am. Geologist, March, 1891, Vol. VII, p. 184; 1894, Vol. XIV, p. 10.

[4] Ibid., 1894, p. 6.

[5] Ibid., Dec., 1895, Vol. XVI, pp. 368, 369, 371.

[6] Pacific Railroad Reports, Vol. III, 1856, p. 100, and Pl. I, figs. 7–10.

Conrad, and the illustrations by F. B. Meek. Conrad's descriptions[1] and references to plates and figures are not accurate, and only Meek's excellent figures and the preservation of the type specimens in the United States National Museum rescue the contribution from confusion. In a geologic discussion of this report Professor Hall again presented his views of the identity of *G. pitcheri* Morton and *G. dilatata*[2] Marcou, which, as shown above, he amplified later. The five lines of description of *G. pitcheri* which Conrad gives do not furnish one of the criteria by which any of the gryphæas can be differentiated, but is so generic that it will fit any one of them.

Mr. Conrad, like Professor Hall, recognized the fact that possibly more than one variety, if not species, had been confused under the general name of *G. pitcheri* Morton. He speaks of "one resembling *G. vesicularis*, and which is the type of the species as figured and described by Morton, and the other truncated anteriorly with a narrow, elongated, boat-shaped umbone, var. *navia*, Pl. VII, fig. 3, *c*, *d*."[3]

Fig. 3*d*, the type of Conrad's var. *navia*, is a poor specimen, which can not be placed satisfactorily. The type of this figure is either an abnormal specimen of *G. corrugata* (Marcou's *G. tucumcarii*, Morton's *G. pitcheri*) or a noncarinated specimen of Marcou's *G. pitcheri*, which Hall described as var. *navia* in the preceding year, and which Gabb later elevated into the species of *G. navia*.[4]

Let it now be noted that two, and possibly three, forms have been called var. *navia*, to wit: Two by Professor Hall (Marcou's *G. pitcheri* and Roemer's *G. pitcheri*) and one by Conrad, which is an indefinite form, possibly different from either of the above, although probably a variety of Marcou's *G. pitcheri*.

Gabb was the first to attempt a differentiation into distinct species of the forms called *Gryphæa pitcheri*. In a communication read before the Academy of Natural Sciences of Philadelphia on February 12, 1861, he said:[5]

> Through the kindness of my friend, Dr. Janeway, I have obtained some specimens of *Gryphæa Pitcherii* from the Indian Territory, near the Choctaw Mission, and I believe I now have the means of proving the identity of the true *G. pitcherii* with the form called by Prof. Marcou *G. dilatata* var. *tucumcarii*.
>
> With the aid of Professor Marcou's figures, 1 to 3, pl. 4, on one hand, and Dr. Morton's types on the other, I have an unbroken series of gradation from one form to the other. I have exhibited the suite to a number of the best naturalists in Philadelphia, and no one has been able to show a break in the series. Mr. Conrad, after a careful examination, pronounced them to be a regular gradation from one variety to another of the same species.
>
> Dr. Morton's original specimens, now lying on the table, as well as the last sentence of his descriptions, show that the beak is "distinctly incurved." Professor Marcou refers a form to this species in which the beak is strongly deflected. This

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[1] U. S. and Mexican Boundary Survey, Vol. 1, 1857, p. 155.

[2] Am. Jour. Sci., 2d series, Vol. XXIV, 1857, pp. 84–85.

[3] The last should read only fig. 3d, for fig. 3c is clearly a side view of the form figured as 3a, 3b, and now in the United States National Museum.

[4] Proc. Acad. Nat. Sci. Phila. for 1861, p. 22. Gabb called the species *navis*.

[5] Ibid., p. 22.

> form, unknown to Dr. Morton, is, I have no doubt, distinct. I have recently gone over the whole subject carefully, with the following results: The oblique, carinated form is a distinct species, and must be called *Gryphæa navis*. The species described by Morton is *the same* as the one called *tucumcarii* by Marcou. The small specimen figured by Morton is said by Marcou to be "incomplete and without the superior valve." This is not so. The specimen is a young one, but is *very perfect*. Dr. Roemer did not see it, because it was lost some time before his visit to Philadelphia, and afterwards discovered by me among some rubbish. The beak and umbone are round, there is no carination, and the figure in the Synopsis will convey a very correct idea of its form. It is as distinctly lobed as the fig. 1, pl. 4, of Geology of N. A.
>
> The large specimen spoken of by Dr. Morton, from the plains of Kiamesha, is more nearly of the form of fig. 3 of the same plate. There is every form between the two varieties, viz: The one figured by Morton in his Synopsis, pl. 15, fig. 9, and the pl. 4, figs. 1 and 2.
>
> I do not wonder that Professor Marcou should have maintained the difference between *G. pitcherii* and *G. tucumcarii*, as he understood them, but the key to the difficulty is this: *G. tucumcarii* is the typical form of *G. pitcherii*, while *G. pitcherii* Marcou is *G. navis*. This can be proven to any person who will take the trouble of investigating the subject.

The authors' studies have substantiated the opinions expressed by Gabb in the foregoing.

In a paper in the Proceedings of the Boston Society of Natural History,[1] dated May, 1861, Professor Marcou makes the following remarks in a footnote:

> I have never seen Morton's original specimen. If the figure in his *Synopsis of the Cretaceous Group of the United States*, Pl. XV, fig. 9, is correct, it differs in its general outline and in the details of both valves from the young specimen of *G. tucumcarii* published in my *Geology of North America*, Pl. IV, fig. 2, and as it differs even more from the young specimen of *G. Pitcheri*, fig. 6, on the same plate, I am led to believe that I did not meet with the true *G. Pitcheri* of Morton in my explorations with Captain Whipple's party. Mr. Ferdinand Roemer having the opportunity of seeing in the company of the late Dr. Morton himself the original specimen at Philadelphia, I naturally followed his identification of *G. Pitcheri*, and if Roemer has made a mistake, I was misled by his description in Die Kreidebildungen von Texas. Thus we shall have three species of Gryphæa: 1, the *G. Tucumcarii* of the Jurassic rocks of Pyramid Mount (New Mexico); 2, the false *G. Pitcheri* of Roemer and Marcou, or the false *G. Pitcheri* var. *navia* of Conrad and Hall of the cretaceous rocks of the false Washita River (Texas), which may be called *G. Roemeri*, in honor of its first discoverer, Mr. F. Roemer; and 3, the true *G. Pitcheri* Morton, which I have never seen, and, consequently, on which I can not give any information as to its stratigraphical position and association with other fossils.

Professor Marcou was mistaken in considering his *G. tucumcarii* distinct from Morton's *G. pitcheri*, and in considering his own *G. pitcheri*, for which he proposes the name *G. roemeri*, the same as Roemer's *G. pitcheri*, later described by Gabb as *G. mucronata*.[2]

The magnificent specimens illustrated on Pl. XXI of the Mexican Boundary Report have a strikingly different aspect from the other forms illustrated therein as *G. pitcheri*, and anyone who has collected in the Tucumcari region would be very apt to consider them the *G. tucumcarii* of Marcou, as Marcou himself asserted them to be. Mr. Conrad later, in 1861, in a letter to Professor Marcou, confessed his doubts as to the identity of these forms with *G. pitcheri*, as follows:[1]

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[1] Vol. VIII, 1862, p. 95.

[2] Geol. Survey California, Palæontology, Vol. II, 1869, pp. 274-275.

> When I drew up the Report in Emory's Survey, I was shown by Professor Hall a series of *Gryphæa*, some of which were undoubtedly your *G. tucumcarii*, as figured on Pl. XXI. Professor Hall thought they graduated into *G. Pitcheri*, and I thought so at the time. The name of your species ought not to have been placed as a synonym to Pl. VII, fig. 3, for it is undoubtedly *G. Pitcheri*.
>
> But the figures on the Pl. XXI represent a species and specimen the locality of which is *unknown* to me, and were engraved *after* I had sent in my report and descriptions. So that I can now say that I do not know whether *G. Pitcheri* is identical with your species or not.

The types of these specimens in the National Museum are labeled from Leon Springs, a point in Trans-Pecos Texas, in the western peripheral region of the Comanche series, almost due south of Tucumcari, and as they are *G. tucumcarii* Marcou, as Marcou himself alleges, this specific name is of no value, for, as we shall show later, they possess all the critical features by which *G. pitcheri* Morton could be distinguished from Marcou's species.

Gabb, in the second volume of the Palæontology of California,[2] made another contribution to the differentiation of these species. He repeated the conclusions previously announced,[3] and redescribed Roemer's *G. pitcheri*, giving it the name *G. mucronata*. Thus three species of the *G. pitcheri* group were clearly defined, viz: *G. pitcheri* Morton (=*G. tucumcarii* Marcou), *G. navia* (=*G. pitcheri* of Marcou and *G. roemeri* of the same author), and *G. mucronata* (=*G. pitcheri* of Roemer).

Still further specific differentiation of the forms called *G. pitcheri* was later made by Hill, Stanton, and Cragin, as follows:

Gryphæa washitaensis Hill.—During the years 1885, 1886, and 1887 the senior author initiated field studies of the various forms which had been called *G. pitcheri* Morton. He found the form (later described in this paper on pp. 59–62, and figured on Pls. XX–XXIII) for which he proposed the specific name *G. washitaensis.*[4]

Gryphæa newberryi Stanton.—In 1893 Mr. T. W. Stanton further cleared up the confused synonymy by redescribing under the specific name of *Gryphæa newberryi*[5] the forms called *G. pitcheri* by Schiel and Newberry, and thus removing them from the *G. pitcheri* group entirely.

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[1] Proc. Boston Soc. Nat. Hist., Vol. VIII, 1861, pp. 96-97. The letter is dated January 25, 1861, a date previous to Gabb's contribution read before the Philadelphia Academy February 12, 1861, and already alluded to.

[2] 1869, pp. 272-275.

[3] Proc. Acad. Nat. Sci. Phila. for 1861, p. 22, 1862.

[4] University of Texas, School of Geology, Check-List of the Invertebrate Fossils from the Cretaceous formations of Texas, Austin, 1889, p. 11; also Prelim. Check-List of the Cretaceous, Invertebrate Fossils of Texas, Bull. 1, Geol. Survey Texas, p. 4, Austin, 1889.

[5] The Colorado formation and its invertebrate fauna: Bull. U. S. Survey No. 106, 1893, pp. 60-62.

Gryphæa gibberosa Cragin.—In 1893 Professor Cragin proposed the name *gibberosa* for a large old-age form of Gryphæa which occurs in the same beds at Austin with the species for which the senior author[1] proposed the name *Gryphæa washitaensis.*

Professor Cragin, as shown on page 30, has also proposed the name *G. pitcheri*[2] var. *hilli* for a form from the base of the Kiowa shales of Kansas.

As a result of this differentiation of the forms which had once been called *Gryphæa pitcheri* Morton, the following specific and varietal names, indicating a differentiation of the species, have been used in the literature of the subject:

G. pitcheri Morton.
G. tucumcarii Marcou (also G. dilatata var. tucumcarii Marcou).
G. pitcheri var. navia Hall.
G. pitcheri var. Navia Conrad.
G. navia Hall Gabb (assigned by Gabb to Conrad).
G. washitaensis Hill.
G. gibberosa Cragin.
G. newberryi Stanton.
G. pitcheri var. hilli Cragin.
Exogyra forniculata White.

According to the law of priority, only the following names for the forms called *G. pitcheri* in the list above given can survive, and these, with certain others to be introduced, will hereafter be used in this paper:

G. corrugata Say. In accordance with the laws of priority, this has precedence over *G. pitcheri* Morton, *G. tucumcarii* Marcou, *G. dilatata* var. *tucumcarii* Marcou, *G. pitcheri* var. *hilli* Cragin, and *G. hilli* Cragin.

G. navia Hall. The synonyms *G. roemeri* Marcou and *Exogyra forniculata* White must be abandoned.

G. mucronata Gabb, 1861, must supersede *G. pitcheri* var. *navia* in part as applied to Roemer's *G. pitcheri.*

G. washitaensis Hill, of which *G. gibberosa* Cragin is a very old form.

G. newberryi Stanton.

In the succeeding chapter, which deals with the systematic classification of the species, this list will be still further modified by the introduction of two new specific names, so that the list of all the above forms will be as follows:

Gryphæa wardi sp. nov.
Gryphæa marcoui sp. nov.
Gryphæa corrugata Say.
    G. corrugata var. tucumcarii var. nov.
    G. corrugata var. hilli Cragin.
    G. corrugata var. belviderensis var. nov.
G. navia Hall.
G. washitaensis Hill.
G. mucronata Gabb.

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[1] Contributions to the invertebrate paleontology of the Texas Cretaceous: Fourth Ann. Rept. Geol. Survey Texas, pp. 189-190, Austin, June, 1893, p. 189, Pl. XXX, figs. 1 and 2.

[2] Am. Geologist, March, 1891, Vol. VII, No. 3, p. 181.

GEOGRAPHIC AND STRATIGRAPHIC DISTRIBUTION OF THE LOWER CRETACEOUS GRYPHÆAS.

Although originally described from the plains of the Kiamitia, in the Choctaw Nation of Indian Territory, and "from the falls of the Verdigris,"[1] the various species referred to *Gryphæa pitcheri* Morton have been reported by various writers from as far north as Kansas and to the westward in New Mexico and Utah. It has also been reported from New Jersey, Alabama, Mississippi, Louisiana, and Mexico, and has even been correlated with species from Europe, Africa, and the Andean regions of South America. In the opinion of the authors the geographic distribution of these species, so far as definitely known, is restricted to the present known areal extent of the Comanche series in southern Kansas, Indian Territory, Texas, New Mexico, and northern Mexico, and owing to the uncertainty surrounding the identity of the species and the correctness of the correlations, assertions of its occurrence in other regions should be carefully examined before acceptance.

Inasmuch as in their studies the writers have never yet found in the Upper Cretaceous any form belonging to the so-called types of *Gryphæa pitcheri* group, the reference to *G. pitcheri* by Schiel, Newberry, and White of a certain form found in the Upper Cretaceous of New Mexico and Utah has often caused much perplexity. Mr. T. W. Stanton, however, has recently shown that this is an entirely different species from the *pitcheri* group, and has removed it from the controversy by giving it the name *G. newberryi*. In view of this fact, this form need not be further considered in the present paper.

Mr. Conrad was the first to assert that *G. pitcheri* occurs in the Upper Cretaceous in New Jersey.[2] No proof of the statement is given, nor has a single specimen which can now be identified with this species ever been found east of Arkansas or in the Upper Cretaceous of North America. Mr. Conrad's erroneous conclusion concerning the existence of the species in New Jersey was probably the authority for its frequent appearance in subsequent literature.

In Dr. C. A. White's paper on Fossil Ostreidæ, published in 1884, *Gryphæa pitcheri* Morton is not only reported as occurring in New Jersey, but that locality is given as the place of its original discovery. Dr. White says:

> This is perhaps one of the most widely distributed and most variable species among the Ostreidæ of North America. It was originally discovered in the Cretaceous strata of New Jersey, and published by Dr. Morton in his synopsis of the Cretaceous formation of the United States.

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[1] This species does not occur in situ at the falls of the Verdigris, a locality a few miles north of Muscogee, Indian Territory, as reported by Morton. The falls are over Carboniferous rocks and no Cretaceous outcrops occur within 100 miles of the locality.

[2] Rept. Mex. Bound. Survey, Vol. I, 1857, Pt. II, p. 141.

We have shown that the species was originally described from what was then Arkansas and is now the Indian Territory, and that the several species here called one are not widely distributed; as we shall show, each is confined to a definite and limited geologic and geographic zone.

Whitfield is the only writer who actually records[1] the finding of this species in New Jersey at various localities, but references to his figures and plates show that the form is not a member of the *Gryphæa pitcheri* group, but is an ally of *Gryphæa vesicularis*.

Hilgard has mentioned[2] *Gryphæa pitcheri* as occurring in what is now known to be the uppermost division of the Cretaceous in Louisiana. Lerch has repeated[3] this identification, but, as shown by the junior author,[4] these identifications are erroneous.

The senior author has already said:[5]

> Varieties of the *G. vesicularis* and *E. costata* in Alabama, Mississippi, and Texas have frequently been confusingly termed *G. pitcheri*, but after most painstaking endeavors and study of the faunas of those regions I have failed to authenticate a single reference of *G. pitcheri* in the Upper Cretaceous.

The first correlation of this species with forms from South America that the writers have found is that given by Roemer,[6] as follows:

> Finally, Mr. Leopold von Buch has brought to my attention the agreement of the Texas specimens with the specimens in his collection, which were collected by Mr. J. Domeyko in the vicinity of the volcano of Aconcagua, in Chile, 30° S., and were designated *G. arcuata*. Probably, also, at least a part of the forms which Coquand and Bayle have described from the same region under the name of *Ostrea cymbium* Desh. are identical with them. Therefore the species possessed a wide distribution on the American continent.

Marcou also[7] speaks of his form of *G. pitcheri* as "having more resemblance to the *G. couloni* (of Europe) than any other species," and says that this resemblance led him to consider the strata from which they came "as the equivalent of the Neocomian of Europe."

De Loriol, in a personal letter, has called the senior author's attention to a certain gryphæate oyster (*O. szajnochai* Choffat) from Benguelaland, West Africa, which had a suggestive resemblance to the forms called *Gryphæa pitcheri* of the Texas region by Coquand. It is impossible, however, to see in the forms figured[8] more than a general resemblance to the genuine *G. pitcheri* (*G. corrugata* Say).

In view of what has already been stated, and anticipating the conclusions to be presented in the later pages, it can only be said at this place that these comparisons have been founded on insufficient data, and that satisfactory extraterritorial correlation for the present would best be eliminated and deferred to more careful studies of the future.

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[1] Mon. U. S. Geol. Survey, Vol. IX, 1885, p. 38.

[2] Preliminary Report of a Geological Survey of Louisiana, 1869, p. 11.

[3] First Ann. Rept. Geol. Survey Louisiana, 1870, p. 78.

[4] The stratigraphy of northwestern Louisiana: Am. Geologist, April, 1895, p. 207.

[5] Neozoic geology of southwest Arkansas: Rept. Geol. Survey Arkansas for 1888, Vol. II, p. 169.

[6] Kreidebildungen von Texas, p. 74.

[7] Geology of North America, pp. 38-39.

[8] Matériaux pour l'étude stratigraphique et paléontologique de la Province d'Angola, par Paul Choffat et P. de Loriol, Genève, 1888, pp. 92-93, Pl. V., fig. 18.

In the accompanying table we have endeavored to show the position of occurrence in the different beds of the various species of Gryphæa, together with their synonymy. The vertical position of these species is also shown in the columnar sections of figs. 1, 2, 3, and 4.

Tabular exhibit of forms which have been called Gryphæa pitcheri.

Species.	Synonymy.	Geologic position.	Geographic distribution.
G. vesicularis Lam., 1806.	G. pitcheri Conrad (in part), 1857. G. pitcheri Hilgard, 1869. G. pitcheri White (in part), 1884. G. pitcheri Whitfield, 1885. G. pitcheri Lerch, 1892.	Upper division of Upper Cretaceous.	New Jersey and Atlantic coastal plain, westward to the Rio Grande; Colombia, S. A.; Europe.
G. newberryi Stanton, 1893.	G. pitcheri Schiel, 1855. G. pitcheri Newberry, 1861. G. pitcheri White (in part), 1876.	Benton, Niobrara.	New Mexico, Colorado, Utah.
G. mucronata Gabb, 1869.	G. pitcheri Roemer, 1849. G. navia Hall (in part). 1856. G. navia Conrad (in part), 1857. G. navia White, 1884.	Washita division; Del Rio clays and Grayson marls.	Cerro Gordo, Arkansas, west to Fort Washita, Indian Territory; Denison, Denton, Handley, Round Rock, Austin, west of New Braunfels. Del Rio, and intermediate points. El Paso and Trans-Pecos Texas.
G. washitaensis Hill, 1889.	G. pitcheri var. dilatata Hill, 1887. G. pitcheri Heilprin, 1890. G. gibberosa Cragin, 1893.	Washita division; Fort Worth and Lower Denison beds.	Denison to Rio Grande via Fort Worth, Belton, Salado, Georgetown, Austin, El Paso.
G. navia Hall, 1856	G. pitcheri Marcou, 1855. G. pitcheri var. navia Hall (in part), 1856. G. navia Gabb, 1861. G. roemeri Marcou, 1861. G. navia Gabb, 1869. Exogyra forniculata White, 1880.	Washita division; Preston Kiamitia.	Goodland, Indian Territory, west to Marietta, south to Belton, Texas. Bexar County.

Tabular exhibit of forms which have been called Gryphæa pitcheri—Continued.

Species.	Synonymy.	Geologic position.	Geographic distribution.
G. corrugata Say, 1823.	G. pitcheri Morton, 1834. G. tucumcarii Marcou, 1851. G. dilatata var. tucumcarii, 1858. G. pitcheri Hall, 1856. G. pitcheri Conrad, 1857. G. pitcheri Gabb, 1861. G. pitcheri Dana, 1880.	Washita division; Preston beds.	Pyramid Mountain, Tucumcari, northeast New Mexico; Kent, Leon Springs, El Paso, Texas; southern Kansas; also at Goodland, Indian Territory, and south side of Canadian Valley, Oklahoma.
G. marcoui sp. nov., 1897.	G. pitcheri Blake, 1855.	Fredericksburg division; Walnut clays and Comanche Peak.	Wise, Parker, Hood, Erath, Comanche, Brown, Lampasas, Hamilton, Coryell, Williamson, Burnet, and Mitchell counties, Texas; and many other localities.
G. wardi sp. nov., 1897.	....	Glen Rose beds.	Travis County, Texas.

SPECIFIC CLASSIFICATION AND EVOLUTION OF THE LOWER CRETACEOUS GRYPHÆAS.

Under the above heading it is proposed (1) to specifically define the various species which have been called *G. pitcheri;* (2) to discover as many data as possible concerning the development and methods of growth of the Lower Cretaceous gryphæas of the Texas region; and (3) to attempt to show their phylogeny.

The work of various paleontologists, most notable among whom are Hyatt, Jackson, and Beecher, has shown the value of the study of the development of the individual as an index to the history of its ancestral forms. The principle involved is one that is almost universally recognized among students of zoology, whether it be the zoology of recent or that of fossil animals, and may be briefly stated in the following words: The successive stages in the development of an individual usually represent adult stages of its ancestors. The appearance of the adult ancestral characters in embryonic or youthful stages is due to acceleration of development. In some cases it is known that certain modifying conditions have induced changes in the development of forms, such as the intercalation of the larval and pupal stages in higher insects. Therefore, in studying development with a view to constructing phylogenetic trees, care must be used to avoid considering these intercalated or modified larval forms as indicating the history of the group.

As the terms employed by previous writers to indicate the stages of development will be applied in this paper to the forms here considered, the following explanation of these terms is presented as given by Jackson:[1]

Protembryo.—The ovum and stages of segmentation of the egg preceding the formation of the blastula cavity.

Mesembryo.—The hollow blastula stage comparable to the condition found in the adults of Volvox and Eudorina types of the Mesozoa.

Metembryo.—The gastrula, comparable to the lower Porifera, in which three cell layers exist, as in the lowest Hydrozoa.

Neoembryo.—The trochosphere. Stages not yet possessing the essential diagnostic characters of the Mollusca; comparable to the embryos of Chætopod worms and Cœlomata.

Typembryo.—The period at which an essential molluscan feature, the shell gland, and plate-like beginning of the shell are discoverable, and yet the embryo is not referable to the class to which it properly belongs.

Phylembryo.—Early veliger stages in which the characters of the class subdivision are indicated and the structure of the shell and other features render the embryo referable to the group of Mollusca to which it belongs.

Completed protoconch and prodissoconch.—The completed first-formed shell of molluscs, the ovisac, fry shell, embryonic shell and larval shell of authors. It finds its representative in the globular, cup-shaped, or spirally coiled protoconch of cephalopods.

Nepionic period.—The period of the first formation of the true shell which succeeds the embryonic shell and is normally retained throughout the rest of life. The period is commonly characterized by marked stages.

Nealogic period.—The period succeeding the nepionic and preceding that period which may properly be considered as the adult. It is frequently characterized by marked stages, being a period in which the growing animal often differs widely from the adult, and as it is of considerable size, the differences and stage are easily recognized. Example, *Hinnites cortesi* has a pecteniform nealogic stage sharply marked off from the Ostreaform adult condition.

Ephebolic period.—That period best characterized by saying that in it the adult characters find fullest expression; it is often separable by marked stages from the earlier nealogic period, and also from the later or senile period.

Geratologic period.—The period of decline of the individual, often marked by distinct stages. The geratologic period is subdivided by Professor Hyatt into the clinologic and nostologic periods, signifying the early and later periods of decline of the individual.

Since the publication of Dr. Jackson's memoir, from which the above is quoted, some changes in the nomenclature of stages have been made.[2] We give these changes for those stages succeeding the nepionic:

Neanic = Nealogic.
Ephebic = Ephebolic.
Gerontic = Geratologic.

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[1] Phylogeny of the Pelecypoda: Mem. Boston Soc. Nat. Hist., Vol. IV. No. 8, 1890, p. 290 et seq.

[2] Hyatt, Bioplastology and the related branches of biologic research: Proc. Boston Soc. Nat. Hist., April, 1893, Vol. XXVI, 1895, p. 94.

It has been shown by various investigators that in the prodissoconch stage of the oyster the umbones are directed posteriorly. At this early stage the young oyster has an anterior and a posterior adductor muscle. Of these two muscles the anterior arises first. At this age the young oyster has a rather straight hinge line. In the adult stage we know that only one muscle is present, and on account of this fact the oyster has been placed in that division of the Pelecypoda known as the Monomyarians. The muscle which remains is the posterior adductor, the first muscle to arise atrophying and disappearing. On account of the disappearance of the anterior adductor muscle, great changes take place in the axes of the animal. The antero-postero axis of the adult, instead of being parallel to the antero-postero axis of the prodissoconch, makes an angle of about 45° with it, the posterior adductor muscle having revolved through an angle of 45°. The development of *Ostrea virginiana*, beginning with the prodissoconch stage and extending to that of the adult, has been worked out in very great detail by Dr. Jackson in his memoir[1] from which the above data concerning the development of the oyster are taken. The writers have, however, been able to verify a good many of his observations from an examination of material which he has prepared. Dr. Jackson has described in a most admirable manner the revolution of the axes of various mollusks due to the diminution or disappearance of the anterior adductor muscle, and for the details of these changes his paper should be consulted.

In only two species were prodissoconchs seen that were well enough preserved to enable the writers to discover the form of the shell in that stage. These species were *Gryphæa marcoui* and *Gryphæa washitaensis*, Pl. II, figs. 1 and 2, and Pl. XX, figs. 1 and 2. In no essential features do these prodissoconchs differ from those of recent *Ostrea virginica* Gmel. The prodissoconch is more or less oval, with the umbones directed posteriorly.

The nepionic, when the specimens are well preserved, is in all cases distinctly marked off from the preceding prodissoconch and the succeeding neanic. This stage has usually the same form in all the species. It is generally elliptical in outline and smooth.

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[1] Phylogeny of the Pelecypoda, the Aviculidæ and their allies, loc. cit., p. 47.

DESCRIPTION OF SPECIES.

GRYPHÆA.

GRYPHÆA WARDI, sp. nov.

Pl. I, figs. 1-16.

Upper valve.—The shape of the valve is irregular in outline. Two different areas can be recognized. First, one in which it is convex, the lines of growth being fine and the surface rather smooth. In this stage there are small ridges running approximately at right angles from the hinge margin. These raised lines when seen in profile present gently rounded upper surfaces with depressions between them. Second, succeeding this stage is one in which the outer margins of the valves turn upward somewhat abruptly. The length of one of the larger specimens is 19 mm., the breadth 18 mm. The margins are milled on the anterior portion. The muscular impression is deeply excavated on the anterior side, but not at all excavated on the posterior. The young of this species is broader than is usually the case in the other gryphæas herein considered; but it resembles those specimens of *G. marcoui* that have a large area of attachment for the lower valve. The sculpture, however, is different. Attention has been called to the fact that the markings running away from the hinge line in the species under consideration present a rounded upper surface. In those specimens of *G. marcoui* which have similarly shaped upper valves the markings are narrow ridges with wide flat areas between them. Whether this difference is of any importance we can not at present say, but probably it is not. No prodissoconch could be discovered; therefore we can not describe that early stage.

Lower valve.—The shape of the lower valve is extremely variable, its chief variation consisting in the amount and mode of attachment. The shells are thin and always small, the largest that we have seen being only 25.5 mm. long. The attached area may vary from 6 to 12 mm., or may be even more across, showing that in proportion to the size of the shell this area is very large. Sometimes the valve is attached to a gasteropod shell, and is correspondingly elongated parallel to the greatest length of the object to which it is attached. The surface may be plain, but is usually ornamented with rather strong folds parallel to the direction of elongation of the shell. The lines of growth are very regular; the margin is sharp and undoubtedly projected beyond that of the upper valve. A short distance within—in one specimen measured to be 2 mm.—are raised lines or crenulations corresponding to those of the upper valve. The direction of the cartilage pit is variable in both the upper and the lower valves, as it depends upon the amount and mode of attachment of the lower valve.

Upon first examining this species it is difficult to decide what its natural affinities with other oysters are, and it is only by comparison with other species that this could be discovered with certainty. The resemblance of the upper valve to that of certain specimens of *G. marcoui* has been pointed out. The forms of the species under discussion with small areas of attachment can not be distinguished from young specimens of *G. marcoui* with a rather large area of attachment. So far as we know, this species does not grow to the normal size of the Comanche Peak form.

The stratigraphic position of this gryphæa is in the Glen Rose beds of the Trinity division.

Specimens have been collected from the roadside between Bee Creek and Pedernalis River, Travis County, Texas, in the Blanco quadrangle on the road leading from Beecaves to Corwin; they have also been collected north of Onion Creek, near Driftwood post-office, Hays County, and Lohmann's Crossing of the Colorado River, Travis County.

As this species occurs not far below *Gryphæa marcoui* of the Comanche Peak formation, and as the two undoubtedly grade into each other, we must regard it as the immediate and undoubted ancestor of the latter.

GRYPHÆA MARCOUI, sp. nov.

Pls. II, III, IV, V.

Gryphæa pitcheri Blake (not Morton). Reports of Explorations and Surveys to ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean, Vol. II, 1855, Pope's Rept. on Route near 32d Par., The Geology of the Route, p. 39.

The following is the description of what may be considered a typical adult upper valve. The usual outline of the valve is oval, with the end which corresponds to the hinge margin truncated. The length of a valve of an ordinary size is 28 mm.; its greatest breadth is 20 mm.; the breadth at the hinge line is 8 mm. The surface for all stages succeeding the nepionic is rough; the cartilage pit, on account of the sharp incurving of the beak of the lower valve, is on the upper surface, and is wide in the specimen described. From the beak to the anterior margin of the cartilage pit is 4 mm. The sides of the valve in the anterior portion are sinuous but not especially thickened. The dorsal margin of the shell is sharply reflexed toward the right; the margins are milled through a variable extent; muscular impression is excavated on the anterior but not on the posterior side; in outline it is oval.

The adult lower valve normally has a strongly incurved narrow beak with a small area of attachment, slight ridges radiating from the beak, and a distinct dorsal sinus. The lines of growth are coarse.

The narrow beak is caused by the mantle spreading out but little in the stages extending from the neanic to the ephebic, including both. In the gerontic it spreads out considerably to the dorsal. It is the narrow incurved beak with a small area of attachment and the occurrence in the gerontic stage of an extremely deep dorsal sinus with a high dorsal wing that characterizes this species.

DEVELOPMENT OF THE UPPER VALVE.

Prodissoconch.—Among the upper valves of this species that we have we did not discover perfect prodissoconchs, but they were sufficiently well preserved to permit one to make out the chief features of the stage.

The form is suboval, with the more pointed end directed anteriorly and the umbones directed posteriorly. The stage is sharply marked off from the succeeding nepionic.

The nepionic.—The relationship that the nepionic growth bears to the prodissoconch is interesting. It should be stated here that the anterior margin of the prodissoconch is directed toward the ventral margin of the adult oyster, and the posterior margin of the prodissoconch is by necessity directed toward the dorsal margin of the adult oyster. The lines of growth of the nepionic extend around the anterior side of the prodissoconch in gentle curves, ceasing near the position of the umbones. The later growth on the ventral side of the nepionic continues in gentle curves. On the posterior side of the prodissoconch the nepionic lines of growth at first extend around in gentle curves, but after a very short time do not extend around it, and build a slight shoulder. The growth at this early stage is of such a character as to form a slight dorsal wing, and there are indications of the dorsal sinus. The surface of the shell in the nepionic stage is smooth, the lines of growth being indistinct. Usually the form is that of an elongate ellipse, the longer axis of the ellipse being parallel to the longer axis of the individual, but in some cases the form is subcircular instead of being elliptical. This variation in form is due to attachment of the lower valve. If the lower valve has a large area of attachment, its method of growth would necessarily be somewhat circular or of an irregular shape, and as the upper valve must conform to the outlines of the lower, we should see a variation of the upper valve corresponding to the varying form of the lower. We have called attention already to the close resemblance of the upper valves in some specimens of *G. marcoui* to those found in the preceding species. The size of the nepionic is about 6 mm. long and 5 mm. wide. In another specimen it is 7.5 mm. long and 5 mm. wide. The figures illustrate the variations well.

An interesting abnormality in this species is shown in one of the upper valves. Instead of adopting the ordinary gryphæate method of growth, by which the increase in growth is approximately the same on each side of a plane bisecting the two valves longitudinally, this specimen has assumed an exogyrate method of growth, the ventral margin growing very rapidly, whereas the dorsal margin has grown but slowly, in this way indicating that should the specimen have reached maturity it would have been forced into a spiral such as is characteristic of Exogyra.

The neanic.—This stage is introduced usually by the lines of growth becoming very distinct, the surface rough, and the postero-dorsal sinus more distinctly marked. In some specimens, in a stage which seems to correspond to the neanic, there are radiating impressed lines, but in the particular specimens to which we allude the surface is not rough, but rather smooth, and it may be that we are mistaken in considering this stage as neanic, though it seems to be such.

The ephebic.—The neanic stage passes imperceptibly into the adult or ephebic stage. The latter stage is indicated by a considerable bending to the right of the dorsal margin of the valve, thus marking very clearly the position of the dorsal sinus.

DEVELOPMENT OF THE LOWER VALVE.

On account of the attachment of the lower valve we were not able to discover the character of the prodissoconch, but the nepionic stage is well indicated. In forms which show small areas of attachment this stage is smooth, rather flat, curving but little, and is usually sharply marked off from the succeeding neanic. In other specimens with large areas of attachment the nepionic stage can not be so easily recognized. The form, at least in the later period of the stage, presents an elongate elliptical outline.

The neanic.—At the close of the nepionic stage the method of growth changes. Instead of being smooth and flat, curvature and very distinct lines of growth are initiated. This curvature seems to be caused by two combined principles. The first is that the lines of growth on the posterior part of the shell are much farther apart than on the anterior portion. This fact in itself would not give curvature unless the calcareous deposit of the mantle in the posterior part were much thicker than in the anterior portion. We know from the study of sections that the deposit of the mantle is thicker in the anterior than in the posterior portion; so this would tend to counteract the curvature. Each succeeding plate laid down by the mantle is at an angle to the preceding plate. The angle between the last plate and the preceding one is less than 180° on the interior of the shell and more than 180° on the exterior; so the chief mechanical principle involved in the curvature is due to the varying angles of these successive plates. It is aided, however, by the growth being more rapid in the posterior than in the anterior portion of the shell.

The ephebic.—The neanic stage is not distinctly marked off from the ephebic. The posterior dorsal sinus in the latter begins to show its characters in the nepionic, and does not increase until what is apparently the gerontic stage is reached.

The gerontic.—At the close of the ephebic stage the sinus becomes very deep and a high dorsal wing is protruded. Although some of the young forms show rather large areas of attachment in the very large suites of specimens we have examined, it does not seem that these specimens ever reach maturity.

In one specimen which we possess an interesting variation is seen. In this specimen, although we have the narrow beak which is one of the characteristics of the species, the margins dilate rather gradually and the shell is very much thicker in the anterior portion, so as to present characters almost identical with those of some forms of *G. mucronata.* In the gradual dilation of the sides also, and in the small curvature of the old-age or gerontic stage, a method of growth very similar to that of *G. corrugata* is assumed.

Geologic position.—In the Walnut clays, the base of the Comanche Peak beds, and occasionally in the Edwards limestone.

This species constitutes the horizon of *G. pitcheri* with *Exogyra texana* as given[1] in Hill's original section, and now known as the Walnut beds of the base of the Fredericksburg division.

Geographic distribution.—Parker, Bosque, Hamilton, Coleman, Coryell, Brown, and Hood counties of north-central Texas, constituting great masses of shell agglomerate, reaching in places 10 feet in thickness. Southward, in Travis, Burnet, and other counties, it is still abundant, but not so gregarious as in north and central Texas.

It is the form figured by Blake,[2] from Big Springs on the Colorado River, and called *Gryphæa pitcheri* by him.

In Edwards County, Texas, we collected the species in the Caprina limestone.

GRYPHÆA CORRUGATA Say.

Pls. V-XV, XVIII and XIX.

Gryphæa corrugata n. s. Say. Account of Exped. Pittsburg to Rocky Mountains, Vol. II, Phila., 1823, pp. 410-411.

Gryphæa pitcheri n. s. Morton. Synop. Org. Rem. Cret. Gr. U. S., Phila., 1834, p. 55, Pl. XV, fig. 9.

Gryphæa tucumcarii n. s. Marcou. Résumé of a géol. recon., etc.; Rept. Expl. R. R. Route from Miss. River to Pacific: Whipple, House Doc. 129, Washington, 1851, pp. 44-48.

Gryphæa dilatata var. *tucumcarii* Marcou. Bull. Soc. géol. France, 2d series, Vol. XII, 1855, p. 880, Pl. XXI, figs. 1, 1a, 1b, 2, and 3.

Gryphæa pitcheri (Morton) Conrad. Rept. U. S. and Mex. Bound. Survey, Vol. I, 1857, Pt. II, p. 155, pl. 7, figs. 3a, 3b, and 3c (3d on this plate is probably a variety intermediate between *G. corrugata* and *G. navia* Hall, being more closely related to the latter species); pl. 10, fig. 2; and pl. 21, fig. 3a, b, c.

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[1] Am. Jour. Sci., 3d series, Vol. XXXIII, 1887, pp. 298-299.

[2] Pacific Railroad Reports, Vol. II, 1855; Pope's rept. on route near 32d par., The geology of the route, p. 39.

Gryphæa pitcheri (Morton) Hall. Rept. Expl. and Surv. R. R. from Miss. River to Pacific, Vol. III, Washington, 1856, Pt. IV, pp. 99-100, Pl. I, figs. 1-6.

Gryphæa dilatata var. *tucumcarii* n. var. Marcou. Geology of North America, Zurich, 1858, pp. 43-44, Pl. IV, figs. 1, 1a, 1b, 2, and 3.

Gryphæa pitcheri (Morton) Gabb. Proc. Acad. Nat. Sci. Phila., Vol. XIII, 1861-1862, p. 22.

Gryphæa pitcheri (Morton) Gabb. Geol. Survey California, Paleontology, Vol. II, Phila., 1869, pp. 272-273.

Gryphæa pitcheri (Morton) Dana. Manual of Geology, 3d ed., 1880, p. 461, fig. 836.

Gryphæa pitcheri (Morton) var. *hilli*. n. var. Cragin. Am. Geologist, March, 1891, Vol. VII, p. 181.

Gryphæa pitcheri var. "*hilli* phase" Cragin. Am. Geologist, July, 1894, Vol. XIV, p. 6.

Gryphæa pitcheri var. *hilli* Cragin. Am. Geologist, July, 1894, Vol. XIV, p. 10.

Gryphæa pitcheri (Morton) Dana. Manual of Geology, 4th ed., 1895, p. 835, fig. 1359.

Gryphæa hilli Cragin. Am. Geologist, Dec., 1895, Vol. XVI, pp. 368, 369, and 371.

The following is Say's original description:[1]

> Among the shells found about Red river, is one which approaches nearest to the variety of the *Gryphæa dilatata* of Sowerby, p. 149, fig. 2, but the lobe is far less distinct, and the shell is far more narrowed toward the hinge, and is somewhat less dilated, and much more like an ostrea. It may be called *G. corrugata;* small valve flat, and very much wrinkled, and like the other, narrowed near the hinge; the beak is short, and curved upwards and laterally, and the sulcus is very distinct. Length and greatest breadth of the small valve nearly equal, from 1¼ inches to 2 inches; found by Mr. Nuttall on Red river. It is in a very perfect state of preservation.

The adult upper valve is subtriangular in outline, the greatest length in a typical specimen being 67 mm., its greatest width about the same; the width at the hinge line is about 22 mm. The margins are slightly crenulated; the shell is thick, being in a typical adult specimen about 11 mm.; the muscular impressions are well marked, slightly impressed anteriorly, and posteriorly there is a raised rim. In the anterior portion the shell is thickened on the sides considerably. These various features are shown in the figures.

Lower valve.—The adult specimen usually shows gradually widening margins with an incurved beak; the shell is boat-shaped and thick. The ligamental pit is large, the lines of growth are coarse, the dorsal sinus is distinct, and there is a considerable wing posterior to it. The beak is usually though not always slightly twisted toward the dorsal margin. The following are the measurements of what may be considered a normal adult: Length, 94 mm.; width, 67 mm.; length of cartilage pit, 14 mm.; greatest width of cartilage pit, 14 mm. An attempt has been made in the accompanying plates to show the variations of the species. The variation in the character of the beak and the reason of it will be stated later. As a usual thing, in the lower valve there is no carina, the region ventral to the dorsal sinus being gently rounded. In some forms, however, which have the beak slightly twisted, although there is no distinct carina, the portion of the shell below the dorsal sinus becomes much constricted. The constriction of this region of the shell is a very important fact and must be borne in mind in comparing it with *G. navia*. There is a great variation also in amount of dilation of the wings, and this variation must be borne in mind in considering the *G. washitaensis*.

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[1] Major Long's manuscript journal: Account of Long expedition, by Edwin James, Vol. II, Philadelphia, 1823, pp. 410-411.

In a collection from Duck Creek, near Denison, Texas, coming from the upper part of the Kiamitia clays, where they grade into the overlying Duck Creek beds, there are forms which can be recognized as belonging to the following species: *Gryphæa corrugata*, *Gryphæa navia*, and *Gryphæa washitaensis*. The *G. navia* approaches *G. corrugata* very closely, and *G. corrugata* apparently grades into *G. washitaensis*, though *G. washitaensis* and *G. navia* have great differences within themselves which would probably prevent their confusion.

Development of the upper valve.—Although we have large suites of this species, we were not able to discover any specimens with well-preserved prodissoconchs. As the prodissoconch is most probably the same for all species of oysters, the failure to discover it in this species is not a matter of very great moment. The nepionic stage was very well preserved and resembles in general characters that of *Gryphæa marcoui* rather closely, except that it is somewhat broader. This stage is characterized by a rather smooth method of growth. Its size is about 11 mm. long and 9 or 10 mm. wide.

Succeeding the nepionic stage the valves widen rather rapidly, with very coarse lines of growth, and a slight ridge near the dorsal margin indicates the position of the dorsal sinus.

Development of the lower valve.—This valve is usually attached during the early periods of growth, and we did not discover the prodissoconch. The stages succeeding this one can be made out with moderate distinctness. In very young specimens two types of development may be recognized. The first is one in which the area of attachment is quite small, or can not be seen, and the nepionic growth is elongate elliptical, the elliptical outline of the growth continuing through a considerable portion of the neanic stage. The second type is one in which the method of growth is not so elongately elliptical or may be subcircular. In one specimen which we studied, the nepionic growth in very early stages was elongate elliptical, and suddenly becomes more nearly subcircular. In some of those specimens which show considerable areas of attachment, we can not discuss the early stages with much satisfaction. The two methods of growth above described lead to two types of adults. The first method of growth leads to an adult with a rather narrow-pointed, sharply incurved beak. The second method leads to an adult with a blunt, slightly incurved beak. As we saw that the early stages of the two different types of growth were practically the same, it seems that the form with the elongate elliptical method of growth was one in which the embryonic characters persisted for a longer time. The neanic stage is marked off from the nepionic, as in the previously described species, by the introduction of a rapid curving of the valve. Some specimens show in this stage slight radiating folds. With the introduction of the neanic stage the dorsal sinus becomes much more distinctly marked, and a dorsal wing is present.

Varieties of Gryphæa corrugata.—This species shows several distinct varietal forms, as follows: (1) *G. corrugata* var. *hilli* Cragin. This occurs in great numbers near the base of the Kiowa shales of the Belvidere beds of Kansas, stratigraphically below the *G. navia* and the larger varietal forms of *G. corrugata* to be mentioned later. This form, called *Gryphæa hilli* by Cragin, is beyond doubt a small ancestral form of *G. corrugata*, and shows comprehensive characters of the three forms *G. marcoui*, *G. corrugata*, and *G. navia*. The figures of var. *hilli* are given on Pl. VIII, figs. 8, 9, 11, 13, 14, and can be compared with the young individuals of *G. corrugata* from Goodland, Indian Territory, Pl. VI, figs. 1–4, and the figures of the cast of Morton's type of *G. pitcheri*, Pl. VI, figs. 5, 6, 7; (2) *G. corrugata* var. *tucumcarii*. The larger forms of *G. corrugata*, such as were figured by Marcou and called by him *Gryphæa dilatata* var. *tucumcarii*, good specimens of which are shown on Pls. XIII, XIV, and XVI, constitute a recognizable variety of *G. corrugata*, and come from a slightly higher horizon of the Washita division; (3) *G. corrugata* var. *belviderensis*. In the Belvidere beds of Kansas the larger specimens of *G. corrugata* (Pls. IX and X) also come from a higher horizon than the smaller forms mentioned and tend to assume a more triangular and flattened outline than the allied synchronous forms called var. *tucumcarii* (see Pl. XIV, figs. 1, 2; XVI, figs. 1, 2, 3; and XVII, fig. 5).

Geological occurrence.—The typical *G. corrugata* Say (*G. pitcheri* Morton) occurs in the upper portion of the Kiamitia beds of the Washita division, near their contact with the Duck Creek chalk, in the Red River portion of the main Cretaceous area. At Denison, Texas, this form appears in a bed in the Duck Creek chalk, which contains the last of the lower-ranging *G. navia* of Hall and the first of the upward-ranging *G. washitaensis* Hill. In the outlying areas *G. corrugata* var. *hilli* is the earliest to appear, and this is succeeded in ascending series by *G. navia*, and then by *G. corrugata* vars. *tucumcarii* and *belviderensis*.

Geographic distribution.—The normal type has its typical development in the main Texas area, in southern Indian Territory from the Arkansas line to Fort Washita, and in Cooke and Grayson counties, Texas. The southernmost localities reported are in the vicinity of Georgetown and Round Rock, Williamson County, and in the northern part of Travis County. The same conditions which have produced known differences in sedimentation between the outlying and main areas of the Cretaceous series seem to have facilitated varietal differences in the forms *G. corrugata*, which may explain the fact that the large forms which we have called vars. *tucumcarii* and *belviderensis* occur only in these outlying areas in Barber, Comanche, Kiowa, and other counties in southern Kansas and along the eastern breaks of the plains; thence southward through Oklahoma to the head of the Washita River; in the Tucumcari region of New Mexico, and near the base of the Rio Grande section west of El Paso, Kent, and other places in Trans-Pecos Texas.

From Nuttall's writings we learn that the exact locality of his original collection was on the plains of the Kiamitia, about 14 miles northwest of the mouth of that stream. The present town of Goodland, Choctaw Nation, is as near the locality as can be identified, and from this place the senior author collected several hundred shells of this species, which are now deposited with his collection in the State capitol of Texas. Later the junior author made a second collection from the same locality, which is now in the United States National Museum.

Phylogeny of Gryphæa corrugata.—In discussing the young forms of this species the two types of growth have been described. Of the two types described, the one with the narrow beak is the one in which it is probable that the embryonic method of growth has persisted for the longest time. This, as we have shown, gives rise to a narrow, elongate beak. We also have noticed in the early stages the presence of narrow radiating folds. Reasoning a priori, we should expect the ancestor of this species to be a form with a narrow beak, and one which possessed radiating folds. In searching for a form which could probably have given rise to this, our attention is directed to *G. marcoui*, which possesses both the narrow incurved beak and the radiating folds. There is stronger reason than this, however, for associating these two species phylogenetically. It was shown in discussing *G. marcoui* that sometimes it assumes a variation which is very similar to the type of growth of *G. corrugata*. Putting together all the facts that we have regarding the development and variations of *G. corrugata*, its stratigraphic occurrence, and those facts that we have concerning the development and variation of *G. marcoui*, the conclusion seems justifiable that the former is descended from the latter or from some closely allied form.

GRYPHÆA NAVIA Hall.

Pls. XVII, XVIII.

Gryphæa pitcheri Marcou (not Morton). Bull. Soc. Geol. France, 2d series, Vol. XII, 1855, p. 883, Pl. XXI, figs. 5, 5a-b and 6.

Gryphæa pitcheri var. *navia* Hall n. var. Rept. Expl. and Surv. R. R. from Miss. River to Pacific, Vol. III, Washington, 1856, Pt. IV, p. 100, Pl. I, figs. 7-10.

Gryphœa pitcheri var. *navia* Conrad (in part). Rept. U. S. and Mex. Bound. Survey, Vol. I, Washington, 1857, Pt. II. p. 155, pl. 7, fig. 3d. (The specimen figured in the place here referred to is a form somewhat intermediate between *G. corrugata* and *G. navia*, but is more closely related to the latter species.)

Gryphœa pitcheri Marcou (not Morton). Geology of North America, Zurich, 1858, pp. 38–40, pl. 4, figs. 5, 5a, b, c, and 6.

Gryphœa roemeri Marcou. Proc. Boston Soc. Nat. Hist., Vol. VIII, 1862, p. 95.

Gryphœa navia Gabb. Proc. Acad. Nat. Sci., Phila. for 1861, 1862, p. 22.

Gryphœa navia (Conrad) Gabb. Geol. Survey California, Paleontology, Vol. II, Phila., 1869, pp. 273-274.

Ostrea pitcheri Coquand (in part). Mon. du genre Ostrea, Terr. Crétacé, 1869, p. 40, Pl. XII, figs. 5 and 6.

Exogyra forniculata n. s. White. Proc. U. S. Nat. Mus., Vol. II (1879), Washington, 1880, Pt. II, pp. 293-294, pl. 4, figs. 3 and 4. Smithsonian Miscell. Coll., Vol. XIX, Washington, 1880, pp. 293-294.

Exogyra forniculata White. Twelfth Ann. Rept. U. S. Geol. and Geog. Surv. Terr., Washington, 1883, pp. 13 and 14, Pt. I, pl. 14, figs. 2a and 2b.

Exogyra forniculata White. Fourth Ann. Rept. U. S. Geol. Surv., Washington, 1884, p. 305, Pl. LII, figs. 1 and 2.

Gryphœa pitcheri Brown (not Morton). Proc. Acad. Nat. Sci., Phila., for 1894, p. 65.

Upper valve.—General form ovate, the posterior dorsal portion reflexed toward the right. The cartilage pit descends somewhat from the apex ventrad. Dorsal margin of the valve considerably thickened; ventral margin of the valve very much thickened. Both the dorsal and ventral margins marked by minute transverse striæ, which are especially distinct on the latter. Posterior margin of the valve not especially thickened. Lines of growth coarse; the plates constituting the shell structure are thick. The nepionic stage distinctly marked off from the succeeding growth. Its size is 12 mm. long by 8 mm. wide. The figures on Pl. XVIII illustrate the characters above described.

Lower valve.—The nepionic and early neanic stages of this valve are practically the same as those individuals of *G. corrugata* which possess a prolonged beak. In the later neanic stage, however, a carina begins to be developed and the mantle spreads out dorsally, thus producing a dorsal wing. On the lower side the valve is sharply incurved, so that a carina is produced. Between the wing to the dorsal of the sinus and the carina there is a depressed area which is frequently marked by slight ridges running from the beak. This species is very easily characterized by the possession of the carina, the depressed area extending from the carina to the dorsal sinus, the bending toward the dorsal margin, and the strong incurving of the beaks. It has already been noted that the features in the young stages of this species are possessed in their entirety by some varieties of *G. corrugata*, and there seems to be no doubt, in spite of the usual great distinctness of the adult of *G. corrugata* and *G. navia*, that they are both derived from an ancestral form of the typical *G. corrugata*.

This conclusion, however, is not based merely on the studying of the development, but the specimens from the Kiamitia clays of Duck Creek, near Denison, connect the two species very closely; in fact, so closely that it is with considerable difficulty that some specimens can be referred to either one or the other.

Geologic and geographic distribution.—In the main Texas area this form is found in the Kiamitia clays at the base of the Washita division, from the Arkansas State line in Indian Territory westward through the prairies of the Kiamitia to near Marietta, and thence southward through Texas to the Colorado, always in the same geological horizon. It is the chief species found on the plains of the Kiamitia, in northern Texas and in Indian Territory, where it occurs by millions. The form is especially abundant at old Fort Washita, Indian Territory, where the buildings are constructed of flags formed almost entirely of these shells. The high prairie surmounting Red River Valley south of old Preston is also marked by this species. In Grayson County, Texas, at the top of the Kiamitia clays, near their contact with the overlying Duck Creek chalk, *G. navia* is mixed with *G. washitaensis* Hill, *G. corrugata* Say, and *Exogyra plexa* Cragin. In the "outlying areas of the Comanche series" the species occurs abundantly in the southern counties of Kansas, Kiowa and Comanche; near old Camp Supply, 10 miles west of north from Taloga, 18 miles north of Arapahoe, 10 miles south of west from Arapahoe, and, according to Mr. G. T. Dulaney, 21 miles north of west from Arapahoe, in the bluffs of Panther Creek, in Oklahoma. Marcou's original localities are between the South Fork of the Canadian and the Washita River, west of Arapahoe. It is very abundant in the Pass of the Rio Grande, 3 miles west of El Paso, Texas.

It is a singular fact that this form does not occur abundantly, if at all, south of the Colorado River, but is apparently confined to the northern provinces of the areal outcrop of the Comanche series.

GRYPHÆA WASHITAENSIS Hill.

Pls. XIX, XX, XXI, XXII, XXIII.

Gryphæa pitcheri Morton, var. *dilatata* Hill. Am. Jour. Sci., 3d series, Vol. XXXIV, 1887, p. 303.

Gryphæa washitaensis Hill sp. nov. Check List of the Invertebrate Fossils from the Cretaceous Formations of Texas, 1st ed., 1889, p. 11.

Gryphæa washitaensis Hill, sp. nov. A Preliminary Annotated Check List of the Cretaceous Invertebrate Fossils of Texas: Bull. Geol. Survey Texas, No. 4, 1889, p. 4.

Gryphæa pitcheri Heilprin (not Morton). Proc. Acad. Nat. Sci., Phila., 1890, p. 452.

Gryphæa gibberosa Cragin. A Contribution to the Paleontology of the Texas Cretaceous: Ann. Rept. Geol. Survey Texas, Austin, June, 1893, pp. 189-190, Pl. XXX, figs. 1 and 2.

The outline of the adult upper valve is elliptical, with a wing protruding on the dorsal side and truncated anteriorly at the hinge line. It is rather deeply concave. The nepionic stage is usually very distinctly marked on the adult valve. The surface in the stages succeeding the nepionic is rather rough, but the lines of growth are delicate. The valve is thin; the dorsal sinus is well marked. The size of a normal adult is: length, 31 mm.; width, 25 mm.; width of cartilage pit, 8 mm.; length of cartilage pit, 4 mm. The cartilage pit is slightly inclined posteriorly—that is, a line running from the base of the cartilage pit to the apex, or where the prodissoconch should be, would have its upper portion inclined toward the posterior margin of the shell. The margins in the posterior part are rather sharp and turned up abruptly; in the anterior portion they are considerably thickened, the thickening being much greater on the ventral than on the dorsal side. The muscular impression is faint.

The lower valve of this species usually has a strongly developed dorsal wing and a considerably developed ventral wing. On account of the strong development of the wings in this species, Mr. Hill has been inclined to class it differently from the others of our Lower Cretaceous Gryphæas. The shell is deeply excavated; the lines of growth are usually rather fine, and the shell is thin. The beak is strongly incurved and the cartilage pit rather deep. The muscular impression is only moderately distinct, being slightly impressed on the anterior side and not impressed on the posterior side. The upper valve sits in the lower valve for a considerable distance. The size and general types of variation of this species are shown in the figures.

DEVELOPMENT OF THE UPPER VALVE.

Prodissoconch.—Of this species most excellent material was obtained. In fact, the specimens are so well preserved that the development of the shell can be made out quite as well as if special pains had been taken to grow the young forms on glass plates, as Jackson did in his study of oysters. The prodissoconch is subcircular, very slightly wider anteriorly than posteriorly; the beak is directed posteriorly and is situated near the posterior margin. It is about 5 mm. in diameter.

The nepionic.—The prodissoconch is followed by the nepionic stage, from which it is sharply marked off. The nepionic growth on the anterior side continues parallel to the margin of the prodissoconch for a considerable time. On the posterior side it at first makes a slight shoulder against the prodissoconch. Ultimately there is a spreading out dorsally, that is, posteriorly to the prodissoconch, so as to form a slight wing. In the early part of the nepionic stage the lines of growth are subcircular or semicircular; as the shell grows older they assume a more elliptical outline. The completed nepionic is elliptical, being truncated on the anterior margin. Its size is about 9 mm. long by 7 mm. wide. The surface is smooth. In the older part of the stage the valve begins to be concave externally. The nepionic stage is marked off from the neanic by the concavity increasing rapidly. The dorsal side of the valve is bent more than the ventral. A dorsal sinus is very slightly indicated and the surface becomes rather rough from the failure of each succeeding layer of growth to cover to the margin the preceding one. The layers of growth turn up a little at the close of their secretion. As each succeeding layer of growth grows in a general way parallel to the valve, these little margins are left standing up.

THE LOWER VALVE.

Prodissoconch.—It is rather phenomenal to find the prodissoconch of the lower valve of a fossil oyster well enough preserved to be studied. In the species under consideration, although the prodissoconch was not well preserved, enough was left to make out its chief features, which coincide with what is known of all other species of oysters; that is, it is subelliptical or suboval, with the umbones directed posteriorly and sharply marked off from the succeeding nepionic.

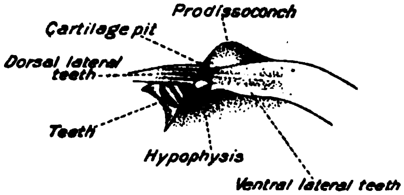

FIG. 1.—Hinge of lower valve of *G. washitaensis*, nepionic stage.

The nepionic.—The nepionic stage is characterized in this species, as in the others, by having a rather flat method of growth. Its surface is smooth; the lines of growth at first are subcircular in form, being truncated along the hinge margin, and gradually become more elliptical. On the ventral side the margin is gently curved, whereas on the dorsal side, even at this early stage, a slight wing is developed. The margins in the anterior portion are crenulated. The posterior portion is flat, rather wide; the muscular impression is rather distinct and has an irregularly quadrangular shape, being somewhat square on the interior ventral side, rounded on the anterior dorsal side, with a short truncation on the posterior side. Along the hinge line ventral to the cartilage pit are apparently two lateral teeth. Dorsal to the cartilage pit are four very narrow lateral teeth; in the posterior portion of the cartilage pit is a small hypophysis. Just interior to the dorsal lateral teeth and subparallel to the margin of the shell are crenulations.

Neanic stage.—Succeeding the nepionic stage the curvature of the valve becomes abrupt and the neanic growth is almost at right angles to the nepionic. For a considerable time after the close of the nepionic stage there are no lateral wings developed, and we should define the neanic stage as that included between the close of the nepionic and that when the dorsal wing begins to be developed to such a large extent.

The adult or ephebic stage was described before discussing the development.

Gerontic stage.—In this stage the shell is gibbous, very thick, and has lost its lateral wings. To a form representing this stage Professor Cragin has given the name *G. gibberosa*.

Phylogeny.—This species presents an enormous amount of variation. In some the lateral wings are very much developed; in other specimens they are but slightly developed, and we have noticed the peculiar type of the neanic growth. This neanic stage corresponds almost precisely to the characters of the adult *G. corrugata*. In the collections from Duck Creek, near Denison, it is almost impossible to separate *G. washitaensis* from *G. corrugata*, and it seems that the two species there grade into each other. From the intergradation of the two species and from the neanic stage of *G. washitaensis*, representing the adult of *G. corrugata*, there seems to be no doubt that *G. washitaensis* is a direct descendant of *G. corrugata*.

The hemera of *G. washitaensis* is from the top of the Kiamitia clays, through the Duck Creek and Fort Worth into the base of the Denison beds, reaching its greatest development in the agglomerates near the base of the latter. It is a fossil which in its greatest development occupies a stratigraphic position above the horizon of *G. corrugata*, and *G. corrugata* reaches its greatest development in beds stratigraphically below *G. washitaensis*. From these facts it seems that *G. washitaensis* of the middle and upper portion of the Washita of Texas is a direct descendant of *G. corrugata*, which became extinct in the lower Washita.

Geologic occurrence and geographic distribution.—*Gryphæa washitaensis* is characteristic of the medial portion of the Washita division, making its first appearance at the contact of the Kiamitia and Duck Creek beds, where it is relatively sparsely represented, and attaining its maximum numerical development in the great sheets of Gryphæa near the contact of the Fort Worth and Denison beds, in the basal portion of the latter. These agglomerates of *Gryphæa washitaensis* can be traced from Denison, on Red River, to Austin, a distance of nearly 300 miles, constituting a unique formation. They are usually, if not always, closely associated with *Ostrea* (*Alectryonia*) *carinata* Lam. The latter does not occur in large numbers, however. This bed is well exposed in the northern suburbs of Denison, near the cemetery, in the railway cuts in the suburbs of Fort Worth, and in the railway cuts of West Austin. *G. washitaensis* is also very abundant in the pass of the Rio Grande west of El Paso.

GRYPHÆA MUCRONATA Gabb.

Pls. XXIV, XXV, XXVI, XXVII, XXVIII, XXIX, and XXX.

Gryphæa pitcheri Roemer (not Morton). Texas mit besonderer Rücksicht, etc., Bonn, 1849, pp. 394–395.

Gryphæa pitcheri Roemer. Die Kreidebild. von Texas und ihre organ. Einchl., Bonn, 1852, pp. 73–74, Pl. IX, fig. 1a, b, c.

Gryphæa pitcheri var. *navia* (in part) Hall. Rept. Expl. and Surv. R. R. from Miss. River to Pacific, Vol. III, 1856, Pt. IV, p. 100.

Gryphæa pitcheri var. *navia*, Conrad (in part). Rept. Mex. Bound. Survey, Pt. II, 1857, p. 155.

Gryphæa pitcheri Owen (not Morton). Second Rept. Geol. Surv. Arkansas, Phila., 1860, pl. 7, fig. 6.

Gryphæa mucronata Gabb sp. nov. Geol. Surv. California, Paleontology, vol. 2, Philadelphia, 1869, pp. 274–275.

Ostrea pitcheri Coquand (in part). Mon. du Genre Ostréa Terr. Crétacé, 1869, p. 40, Pl. IX, figs. 9–12.

Gryphæa navia (Conrad in part). White, Fourth Ann. Rept. U. S. Geol. Survey, 1884, p. 302, Pl. XLIX, figs. 3, 4, 5, and 6.

Upper valve.—Form usually elongate oval, generally thick, frequently much thickened along the margins in the anterior portion, especially on the ventral side. Size indicated on plate.

Lower valve.—Owing to the varying size of the attached area the form of the shell is very variable. The typical form is naviate, with a sharp, constricted, much incurved beak. The shell is massive, very much thickened in the anterior portion, and the lines of growth are very coarse. The dorsal sinus is distinctly marked.

The general characters of this species and its development correspond very closely with *Gryphæa marcoui*. It can be distinguished by the following characters: In the first place, it is a larger shell than *Gryphæa marcoui*. In the second place, the region of the beak is not quite so much constricted; the dorsal sinus is indicated at a considerably earlier stage. The lines of growth are much coarser and the shell is more ponderous. Another distinction is the great variability of this species, which the figured specimens show.

In a species which presents such enormous variations as the one under consideration, it is necessary to try to discover some characters which will enable us to recognize it. The method that we have used is to get a large suite of specimens, and by careful comparison show the intergradation of the forms; but it seems that some characters can be discovered which are common to the whole series. One of these is, in a general way, the width of the adult valves, which is approximately the same. Another is in the texture of the shell. The lines of growth are very coarse, and the successive layers which compose the shell are very thick. Although these characters will appear as extremely meager, yet of all the specimens of Gryphæa which have passed under our notice none present the exact duplicates of what are seen in *Gryphæa mucronata.* We have given figures illustrating the principal types of variation found in this species, and it is to be hoped that from these one may be able to recognize the form.

Development of the upper valve.—The great variation of this species depends to a large extent upon the variation in the size of the attached area. Some of the specimens are attached only by a very small area, whereas in others the area of attachment is one-fourth to one-third of the whole outer surface of the upper valve. This variation in the amount of attachment has induced a corresponding variation in the shape and method of growth of the upper valve. One specimen showed faint indications of the presence of the prodissoconch, but these were so faint that an accurate description of the prodissoconch is impossible. It can be discovered, however, that the umbones were directed posteriorly. The nepionic stage is not very well marked off from the succeeding neanic, but in the typical valve—that is, one in which the area of attachment is small—the method of growth is elongately elliptical. The lines of growth are not very well marked, but with the introduction of the neanic they become much more distinct. The neanic can not be separated from the succeeding ephebic. The dorsal sinus does not become very distinct until the shell has attained considerable size, and even then sometimes its position can be made out only with difficulty. In searching for similar development in other species, we find that it more closely resembles what is discovered in *G. marcoui*, the form being much more like that of the latter species than that of *corrugata.*

The development of the lower valve.—In specimens with a wide area of attachment not a great deal can be said as to the development. In specimens of small areas of attachment the nepionic stage is quite distinctly marked, it being rather flat, with very slight indications of a dorsal wing. The form is rather elongate elliptical, depending in shape to a considerable degree upon the extent of the attached area. In the specimens with the small areas of attachment the nepionic growth is somewhat marked off from the succeeding growth. In a general way the nepionic method of growth is continued far into the later life of the mollusk; that is, the elongate-elliptical outline of the lines of growth continues, but at the close of. the nepionic stage the curvature of the shell begins. We have also in this species, as was noticed in *Gryphæa marcoui*, the frequent occurrence of slight ridges, which radiate from the beak. The dorsal sinus in the adult is also distinctly marked. In the adult shell, which has a small area of attachment, we have a rather narrow and strongly incurved beak, always showing at its tip an indication of the point of fixation.

Gryphæa mucronata occurs in greatest abundance in the upper portion of the Del Rio (*Exogyra arietina*) beds and in the base of the overlying Shoal Creek limestone from the Brazos southward to the

Guadalupe. It is well shown in Shoal and Barton creeks, near Austin. North of the Colorado it occurs abundantly in the Grayson beds overlying the Main street limestone, as near Handley, a few miles east of Fort Worth, and northward toward Red River at Denison. It also occurs in the Trans-Pecos region and as far west as Sonora, according to Gabb.

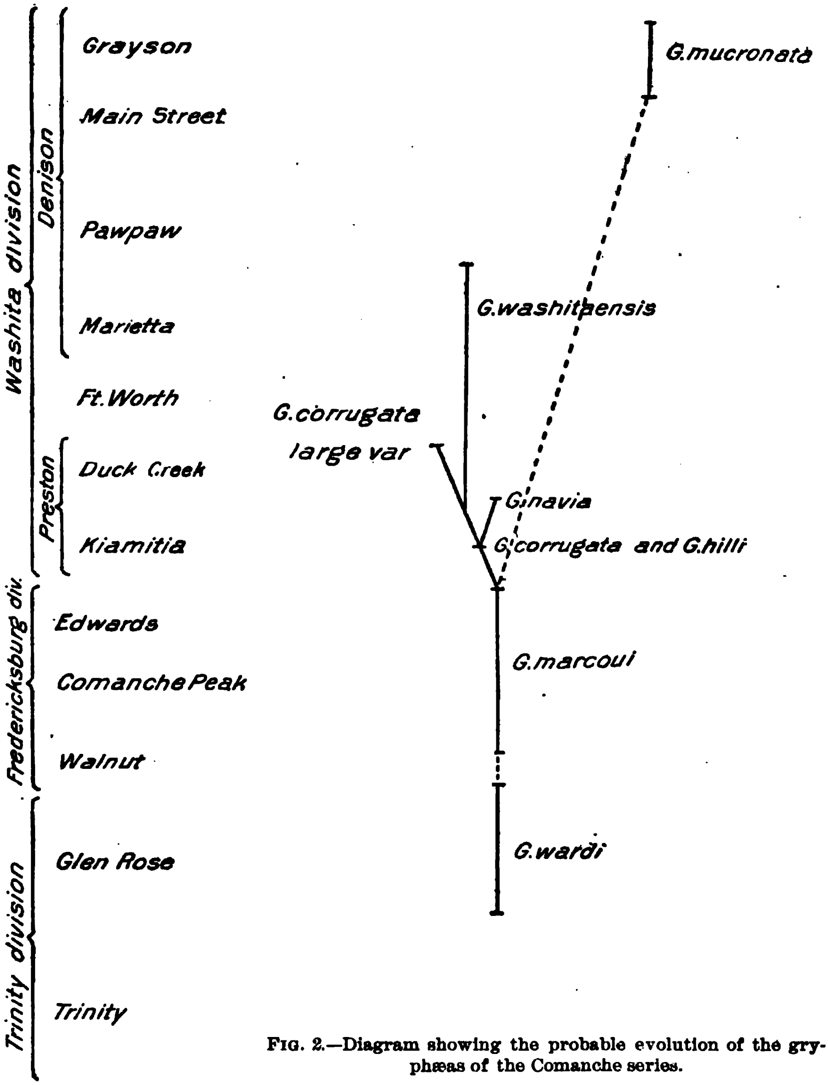

FIG. 2.—Diagram showing the probable evolution of the gryphæas of the Comanche series.

RELATIONSHIP AND EVOLUTION OF THE GRYPHÆAS.

From the foregoing study of the development, variation, and stratigraphic distribution of the gryphæas, it seems probable that the résumé of their genetic relationships shown in fig. 2 is correct.

The earliest form found is *Gryphæa wardi* of the Glen Rose beds of the Trinity division. From it the *G. marcoui* of the Walnut clays, Comanche Peak limestone, and Edwards limestone was derived by direct descent. The beds intervening between the Comanche Peak limestone (of the Fredericksburg division) and the Kiamitia clays (at the base of the Washita division) have yielded but few specimens of Gryphæa, so we have not been able to discover as definite intermediate examples between the species occurring in the two beds above mentioned as we desired.

The next Gryphæa to occur after the *G. marcoui* is the variety of *G. corrugata* called by Cragin *G. hilli*, found in the Champion shell bed of Cragin at the base of the Kiowa shales, and immediately overlying the Cheyenne sandstone, near Belvidere, Kansas. This variety, though referable to *G. corrugata*, presents many synthetic characters connecting the Gryphæas of the Washita division with the *G. marcoui* of the Fredericksburg. From this variety as a lateral offshoot, the *G. navia* of the Kiamitia clays has originated on one hand; on the other, and usually occurring above the *G. navia*, the large varieties of *G. corrugata*, *tucumcarii*, and *belviderensis* have arisen. From the larger forms of *G. corrugata*, as can be shown by the direct intergradation of the species, *G. washitaensis* was derived in the latter part of the time of the deposition of the Kiamitia clays. *G. corrugata* does not range above the Duck Creek chalk, while *G. washitaensis* continues through the Fort Worth limestone into the base of the Marietta beds.

In the upper marly layers of the Denison beds at the top of the Comanche series *G. mucronata* appears. This form, although in general a more robust species, in some of its varieties is almost a reappearance of *G. marcoui*, and there seems no doubt that it is a descendant of the latter form, furnishing an interesting example of how a similar or only slightly modified form may reappear after a long interval of time, when similar physical conditions recur.

PLATES.

PLATE I.

PLATE I.

GRYPHÆA WARDI sp. nov. (pp. 49–50).

Figs. 1–5. Upper valves. Fig. 1 enlarged twice; others natural size.

6–16. Lower valves. All natural size.

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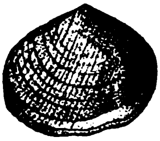
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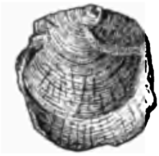
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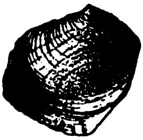
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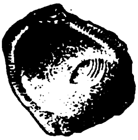
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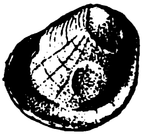
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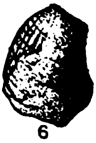
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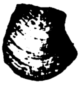
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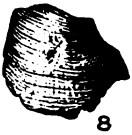
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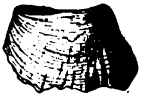
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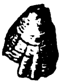
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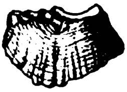
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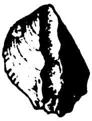
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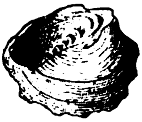
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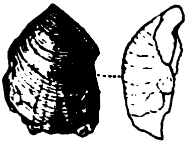
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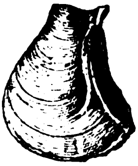
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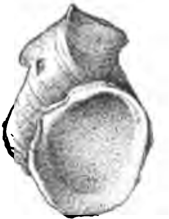
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GRYPHÆA WARDI.

PLATE II.

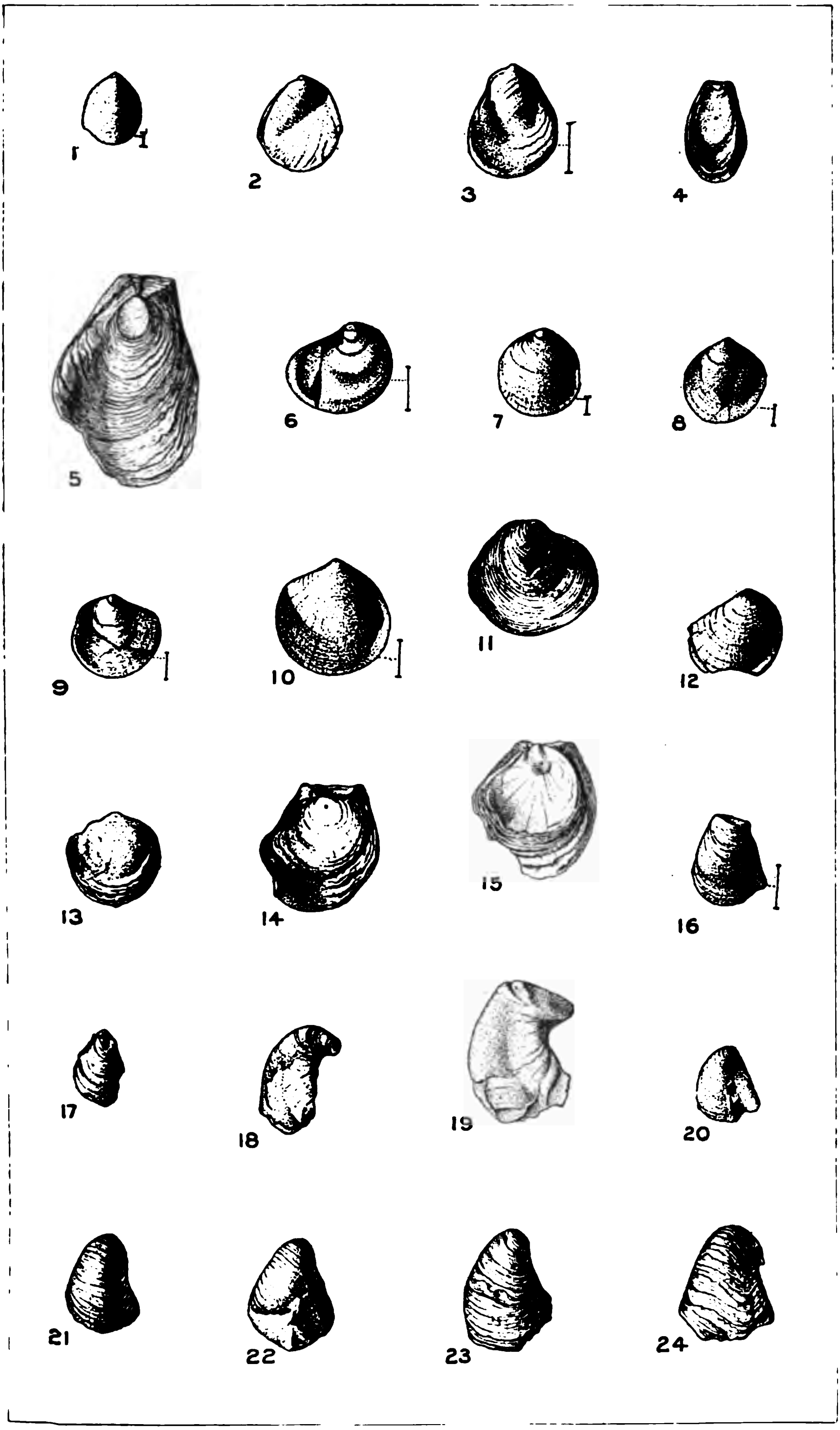
PLATE II.

GRYPHÆA MARCOUI sp. nov. (pp. 50–53).

Figs. 1–15. Series of upper valves, showing the development of the elliptical type of valve. Figs. 1 and 2 show small prodissoconchs. Note the smooth nepionic stage, succeeding the prodissoconch stage. Fig. 6 is a young upper valve (p. 51) of the nepionic stage that shows a tendency toward an exogyrate growth. Figs. 7–15 show development of the broader type of valve. Figs. 7–11, valves in the nepionic stage. Figs. 7–9 have parts of the prodissoconchs still attached, and the outline thereof is preserved in fig. 7, although the apex is worn off.

Figs. 16–24. Young stages of lower valve. Figs. 16, 17, and 20 are the nepionic stage. Figs. 18 and 19 show the sharp curvature at the close of the nepionic and beginning of the neanic stage.

All figures natural size except where otherwise indicated on plate.



GRYPHÆA MARCOUI.

PLATE III.

PLATE III.

GRYPHÆA MARCOUI sp. nov., lower valves (pp. 50–53).

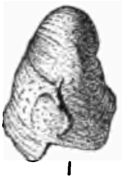
Figs. 1–4. Types of young valves.

5 and 7–10. Variations of the valves of adults (further shown in figs. 1–4 of Plate IV).

8. Specimens passing into gerontic stage. (See also fig. 1, Pl. IV.)

6, 6*a*. Section of a valve. Fig. 6*a* enlarged to show method of overlapping of the successive plates.

All natural size.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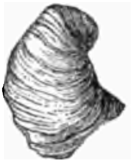
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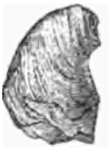
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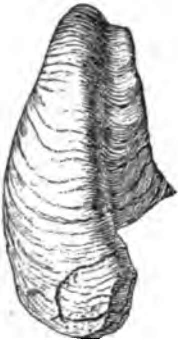
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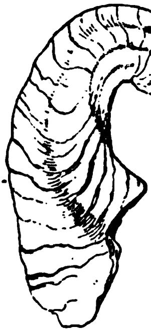
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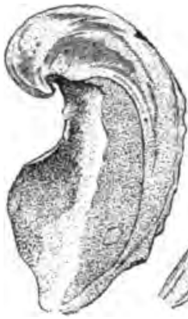
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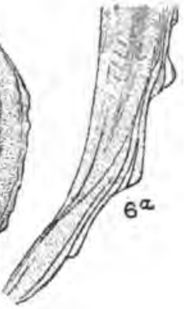
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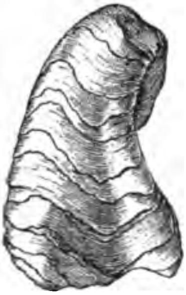
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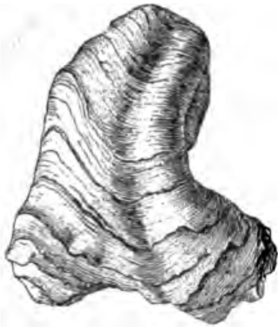
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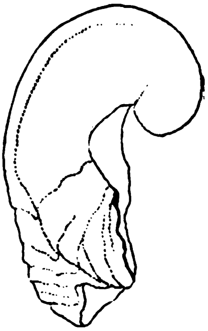
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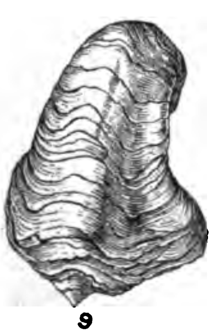
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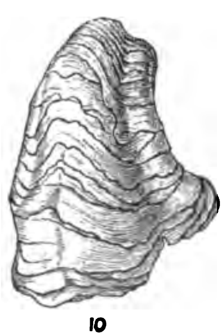
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GRYPHÆA MARCOUI

PLATE IV.

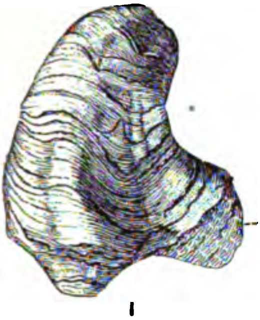
PLATE IV.

GRYPHÆA MARCOUI sp. nov., adult forms (pp. 50–53).

Figs. 1–3. Specimens showing passage into gerontic stage. Figs. 2 and 3 are reverse views of same specimen.

1, 1a, 3–7. Lower valves. Figs. 5–7. Views of same specimen.

All figures natural size.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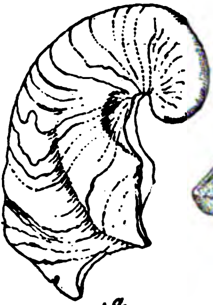
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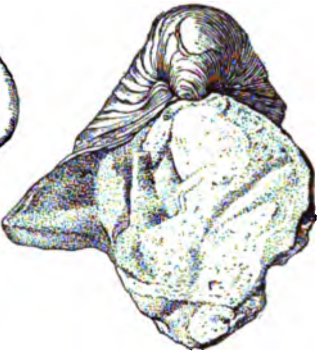
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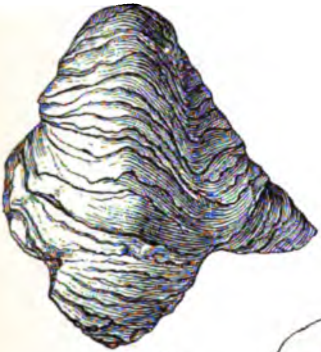
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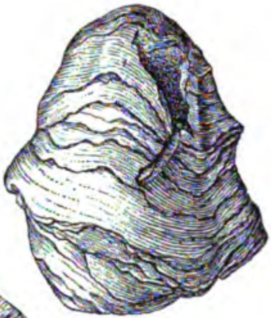
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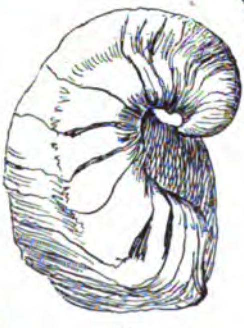
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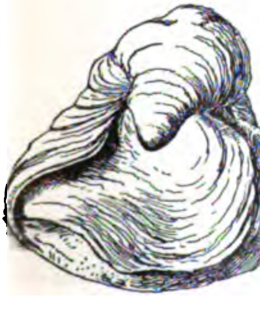
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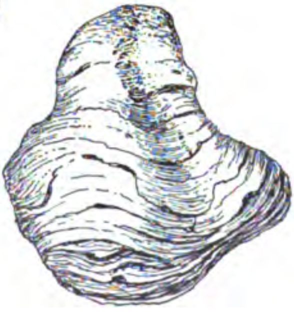
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GRYPHÆA MARCOUI.

PLATE V.

PLATE V.

Gryphæa marcoui sp. nov., adult forms (pp. 50–58).

Figs. 1, 2. Different views of a single specimen.

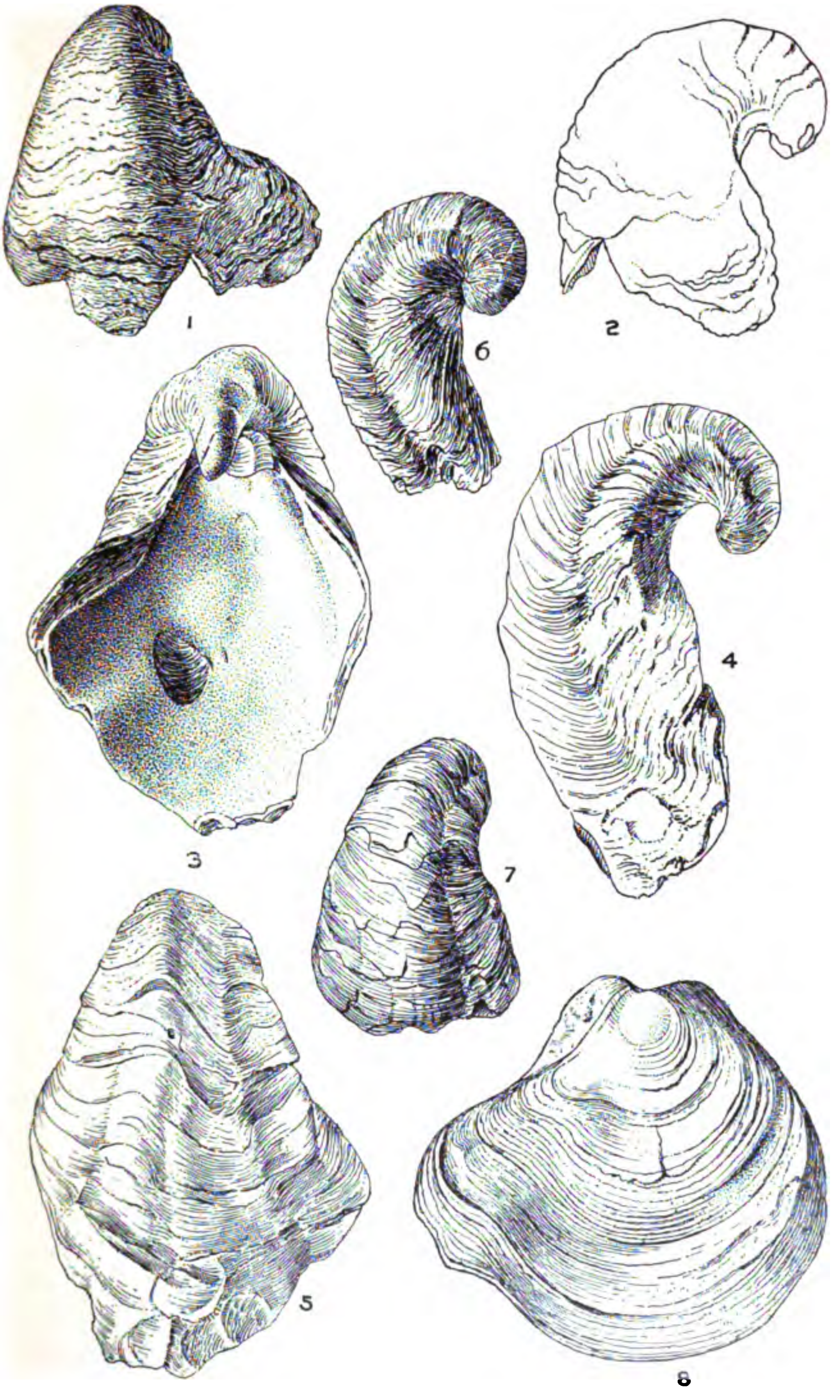
Figs. 3, 4, 5. A specimen which in its later growth gently flared out, assuming a method of growth similar to *G. corrugata* Say (see pp. 53–57).

Figs. 6, 7. Different views of a specimen from the Edwards limestone.

Gryphæa corrugata Say (pp. 53–57).

Fig. 8. Upper valve. Note the early stages of growth.

All figures natural size.



GRYPHÆA MARCOUI and G. CORRUGATA.

PLATE VI.

PLATE VI.

PLATE VI.

GRYPHÆA CORRUGATA Say (pp. 53–57).

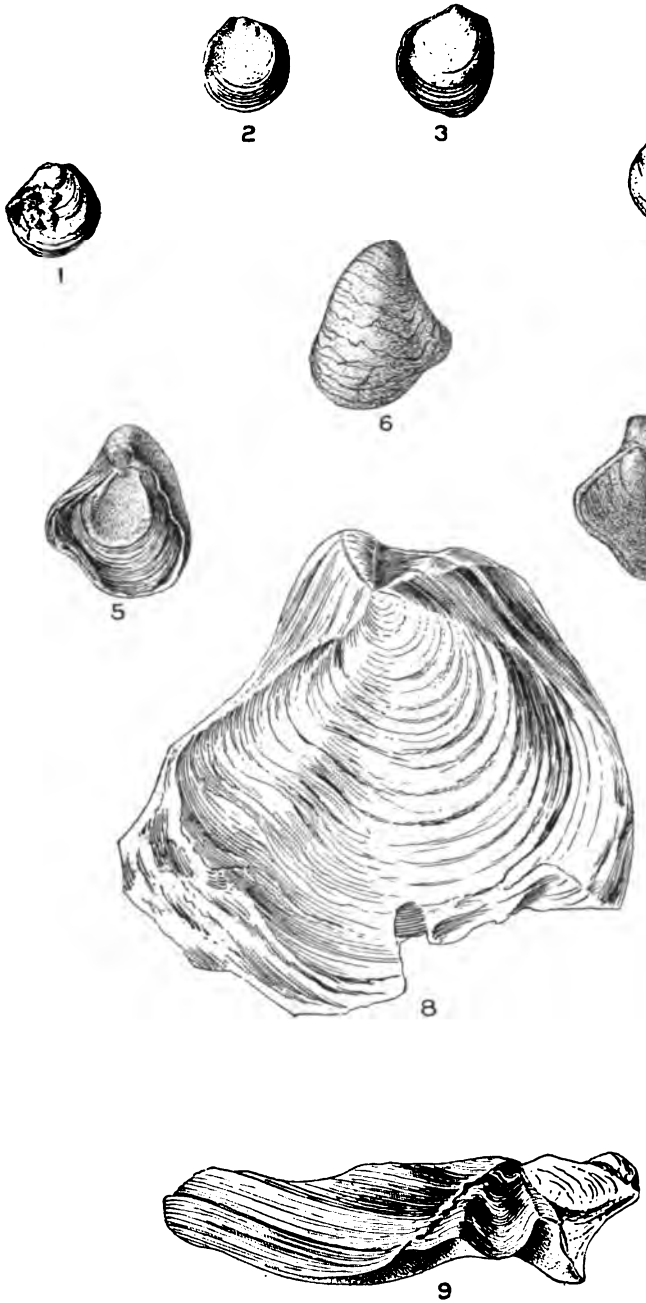
Figs. 1–4. Young valves, showing the smooth nepionic stage.

Figs. 5–6. Drawings of casts of Morton's original types of *Gryphæa pitcheri*. The casts were very kindly furnished us by Prof. F. W. Simonds, of the University of Texas.

Fig. 7. A copy of Morton's original figure of *Gryphæa pitcheri.*

Figs. 8, 9. Two views of same valve.

All figures natural size.



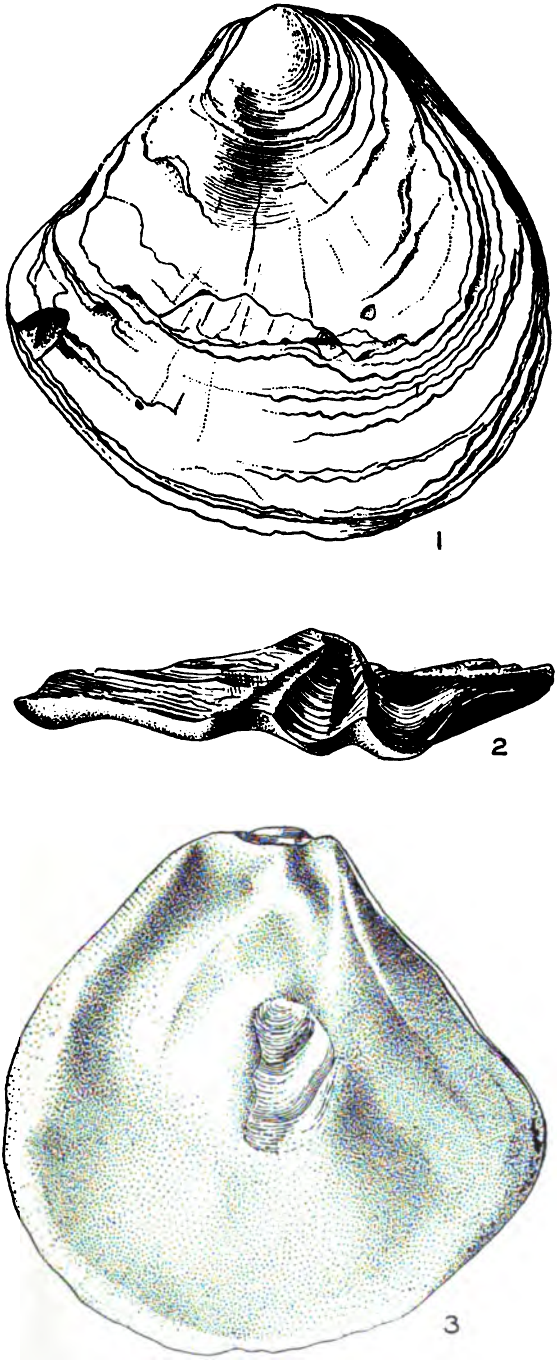
GRYPHÆA CORRUGATA Say.

PLATE VII.

PLATE VII.

GRYPHÆA CORRUGATA Say (pp. 53–57).

Figs. 1–3. Upper valves; natural size.



GRYPHÆA CORRUGATA Say.

PLATE VIII.

PLATE VIII.

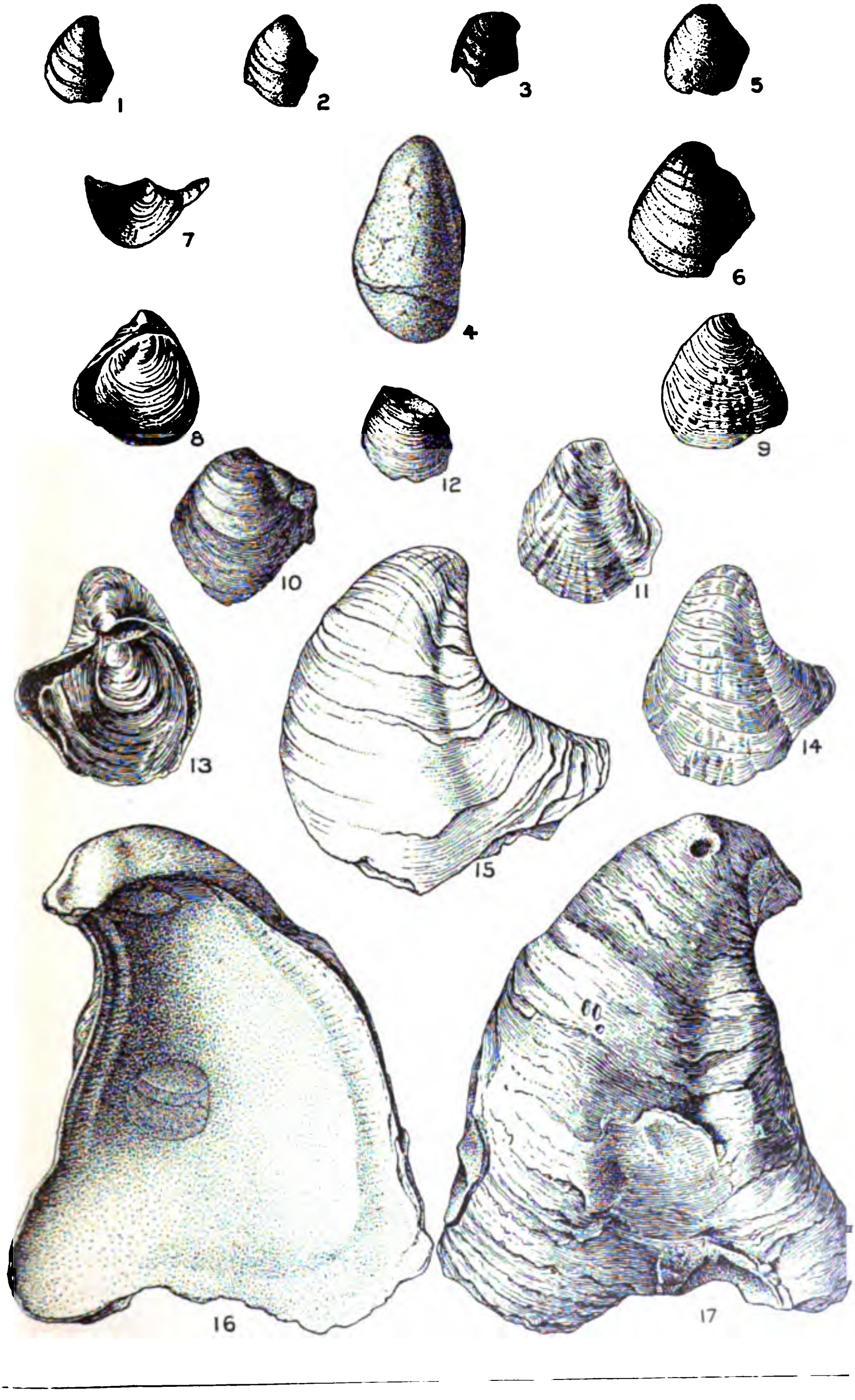
Gryphæa corrugata Say (pp. 55–57).

Figs. 1–14 represent young specimens.

8–9 (the same specimen), 11, and 13–14 (the same specimen) are of the form from Belvidere, Kansas, to which Cragin applied the name *Gryphæa hilli.* Compare figures 13–14 of this form with the figures of Morton's type, Pl. VI, figs. 5, 6, and 7.

16–17 represent an abnormal adult individual.

All figures natural size.



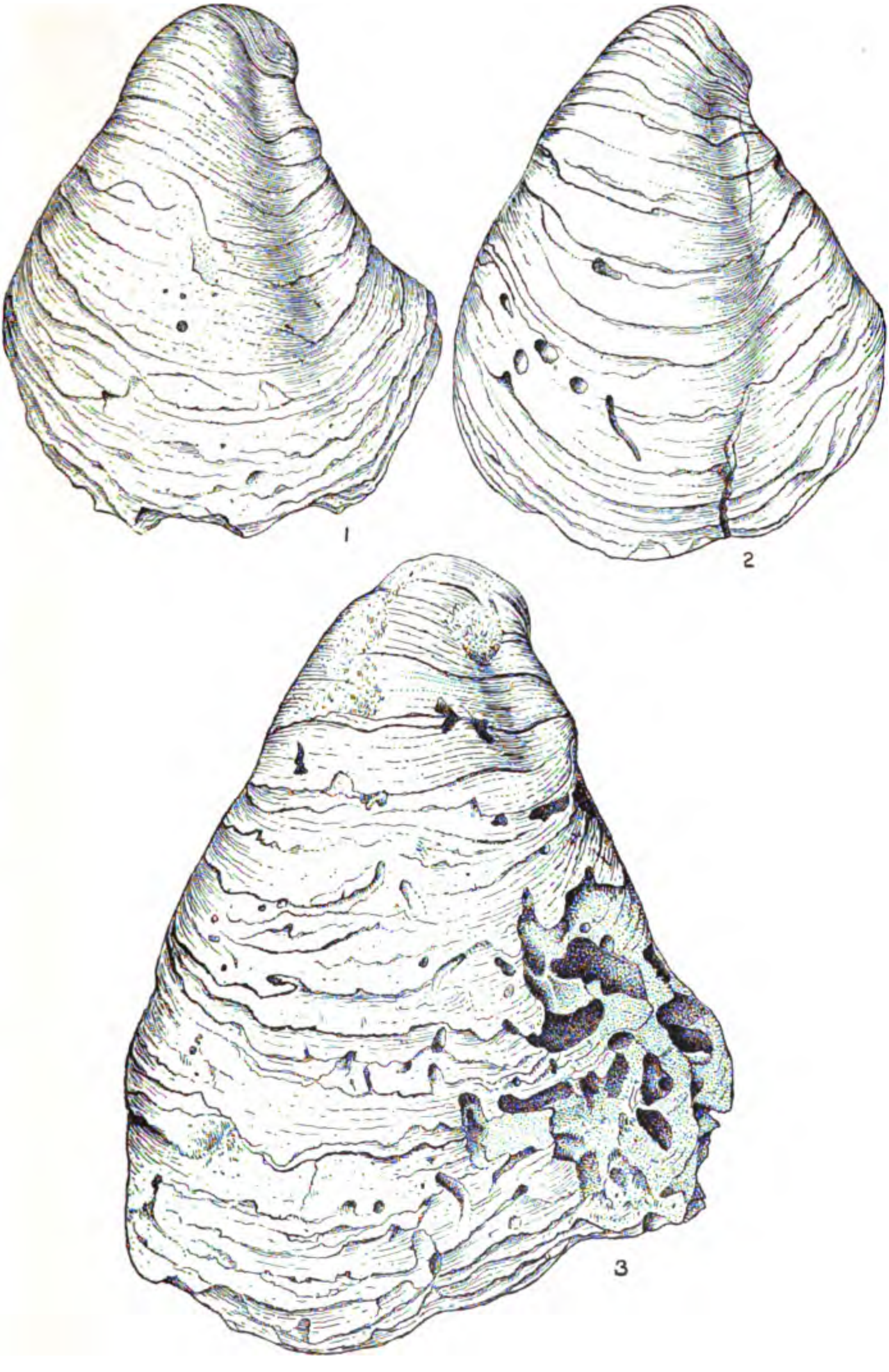
GRYPHÆA CORRUGATA Say.

PLATE IX.

PLATE IX.

Gryphæa corrugata Say, var. **belviderensis** (p. 56).

Figs. 1–3. Adult lower valves from near Belvidere, Kansas.
Natural size.



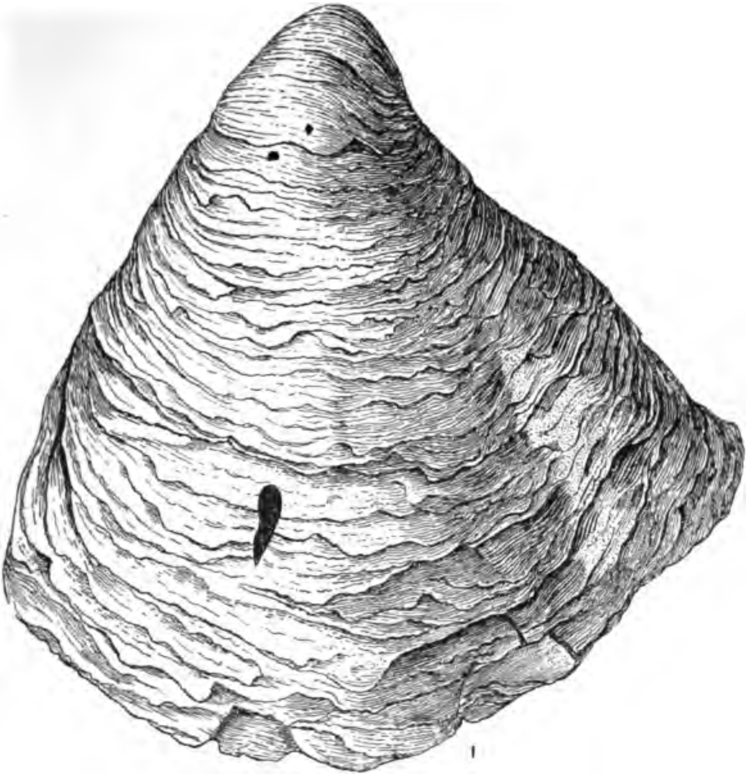
GRYPHÆA CORRUGATA Say var. BELVIDERENSIS.

PLATE X.

PLATE X.

GRYPHÆA CORRUGATA Say, var. BELVIDERENSIS, maximum size (p. 56).

Figs. 1 and 2. Adult lower valve, two views of the same specimen. Natural size.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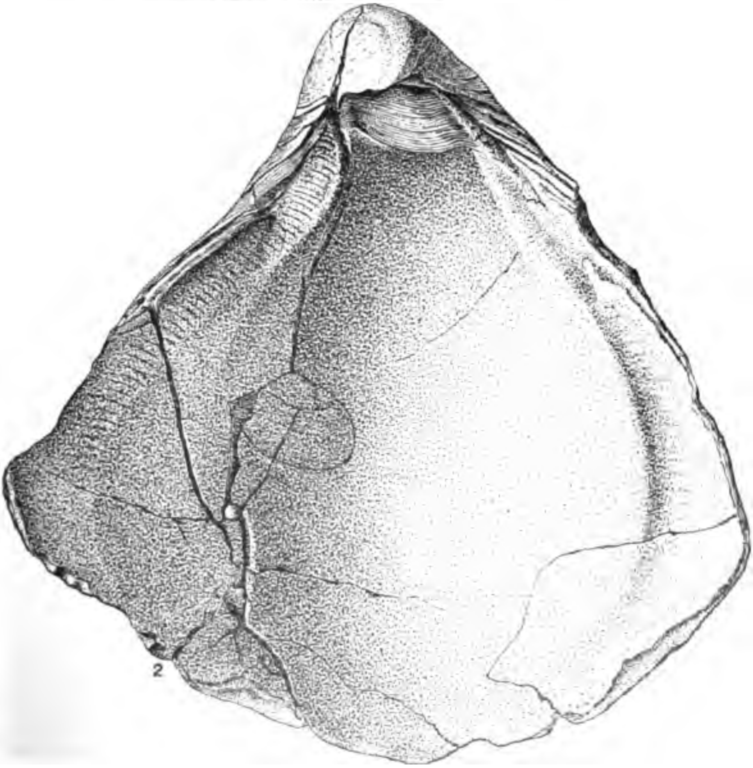
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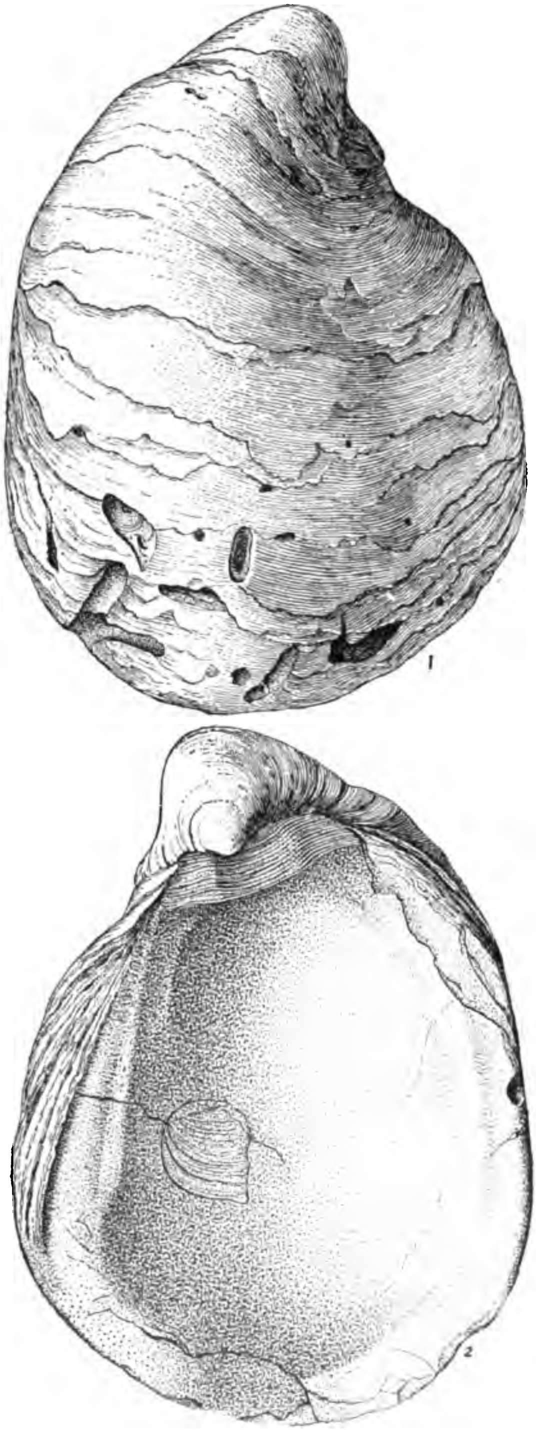
PLATE XI.

PLATE XI.

Gryphæa corrugata Say (p. 56).

Figs. 1, 2. Adult lower valves from Belvidere, Kansas, showing variation. Natural size.



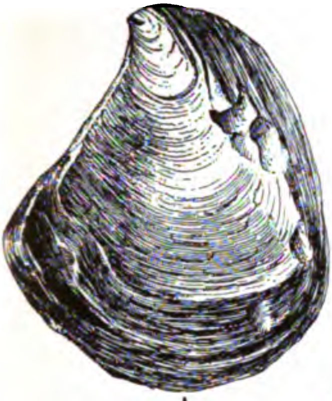
GRYPHÆA CORRUGATA Say

PLATE XIII.

PLATE XIII.

GRYPHÆA CORRUGATA Say, var. TUCUMCARII (p. 56).

Figs. 1–5. Specimens from Tucumcari, New Mexico. Collected by Prof. Alpheus Hyatt. Natural size.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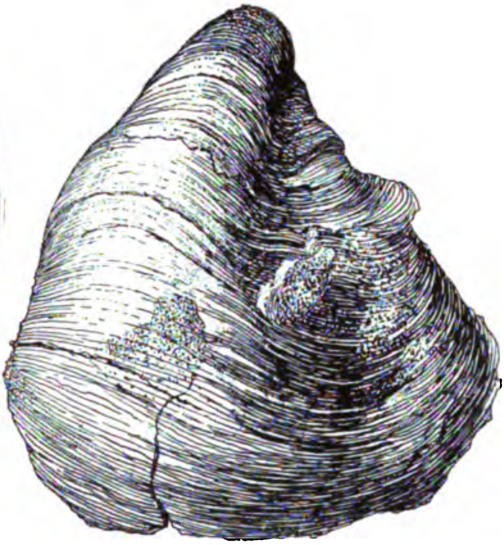
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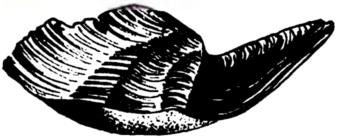
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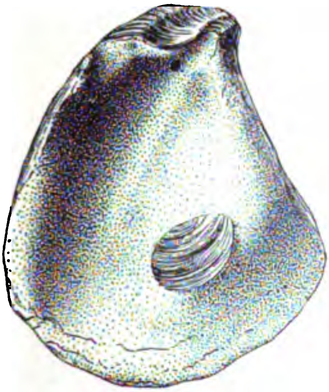
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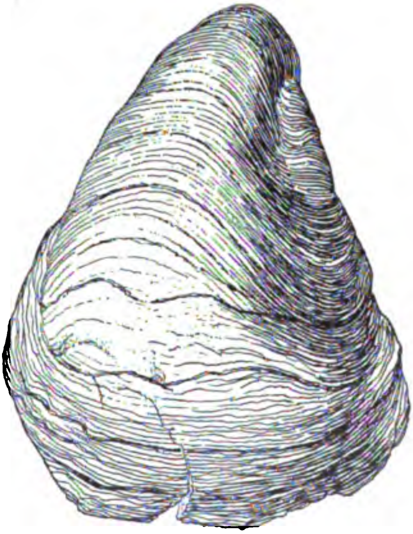
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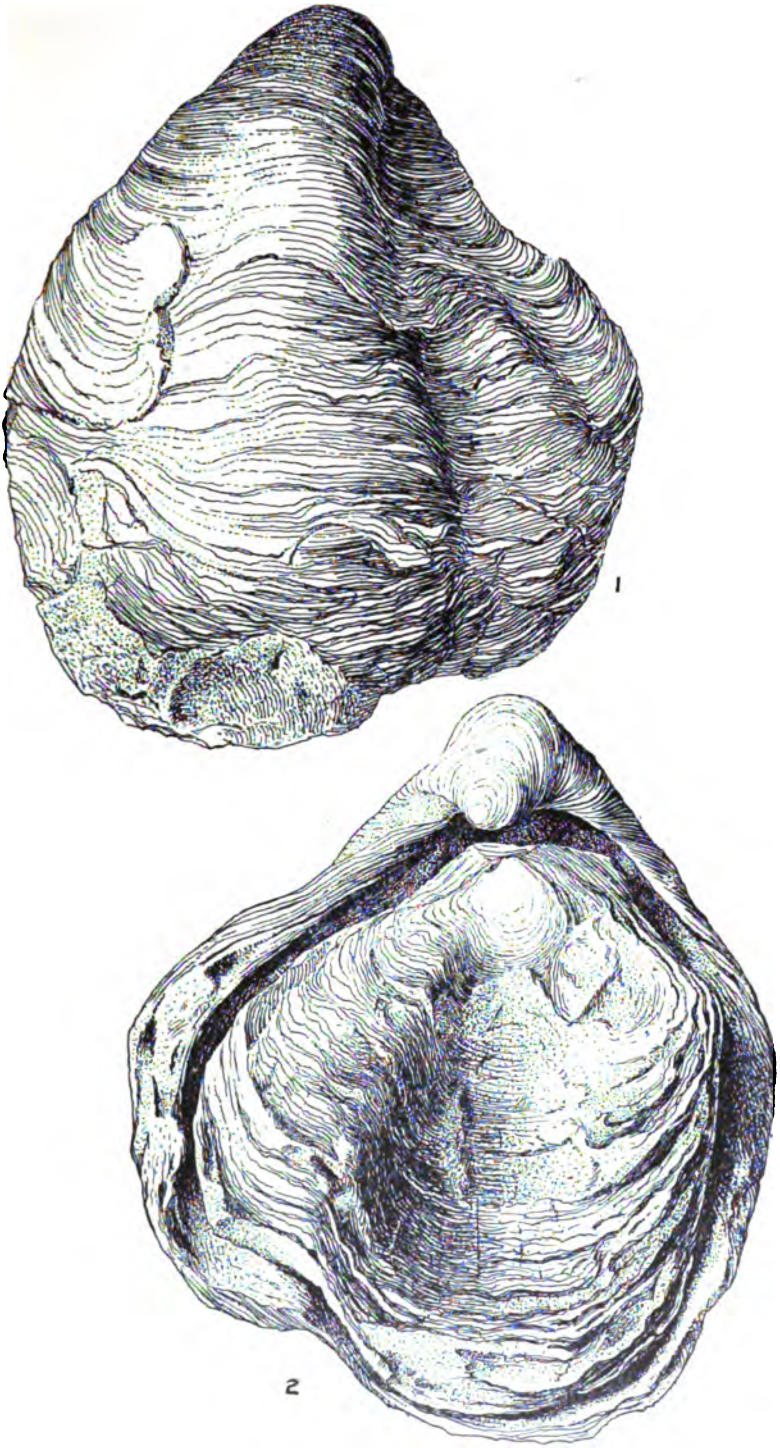
GRYPHÆA CORRUGATA Say var. TUCUMCARII.

PLATE XIV.

PLATE XIV.

GRYPHÆA CORRUGATA Say, var. TUCUMCARII (p. 56).

Figs. 1, 2. From Tucumcari Mesa, New Mexico. Maximum size. Collected by Prof. Alpheus Hyatt. Natural size.



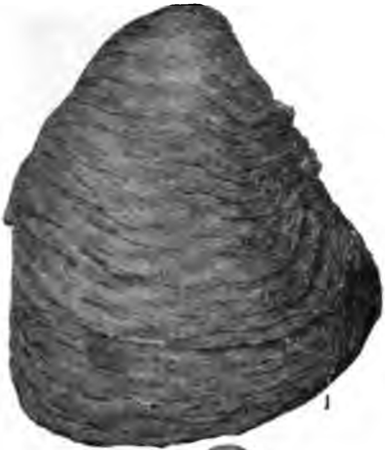
GRYPHÆA CORRUGATA Say var TUCUMCARII

PLATE XV.

PLATE XV.

GRYPHÆA CORRUGATA Say (pp. 53–57).

Figs. 1–7. Reproduced from figures by Prof. James Hall, described as *G. pitcheri* Morton, in United States Explorations and Surveys for a Railroad Route from the Mississippi River to the Pacific Ocean, Senate Ex. Doc. 78, Vol. III, Pt. IV, Geology, Plate I, Washington, 1856. Figures natural size.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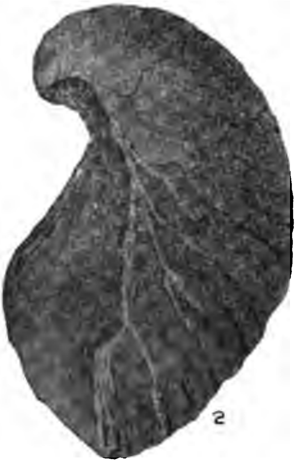
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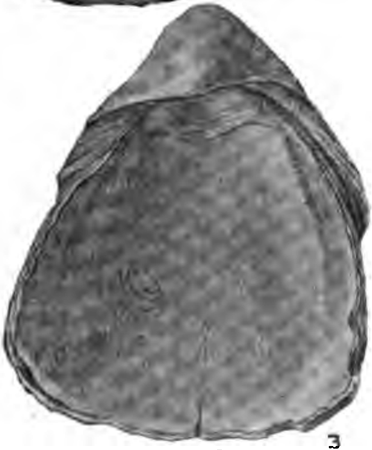
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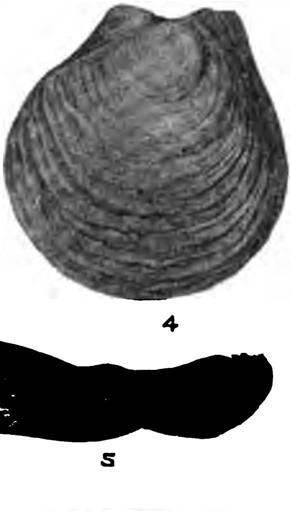
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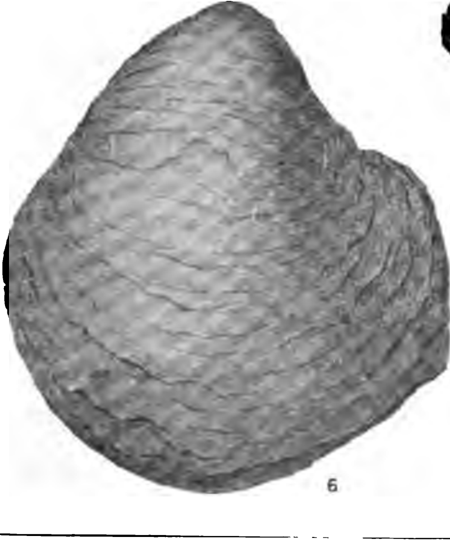
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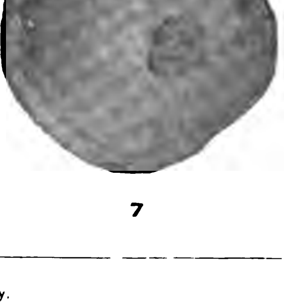

7

GRYPHÆA CORRUGATA Say.

PLATE XVI.

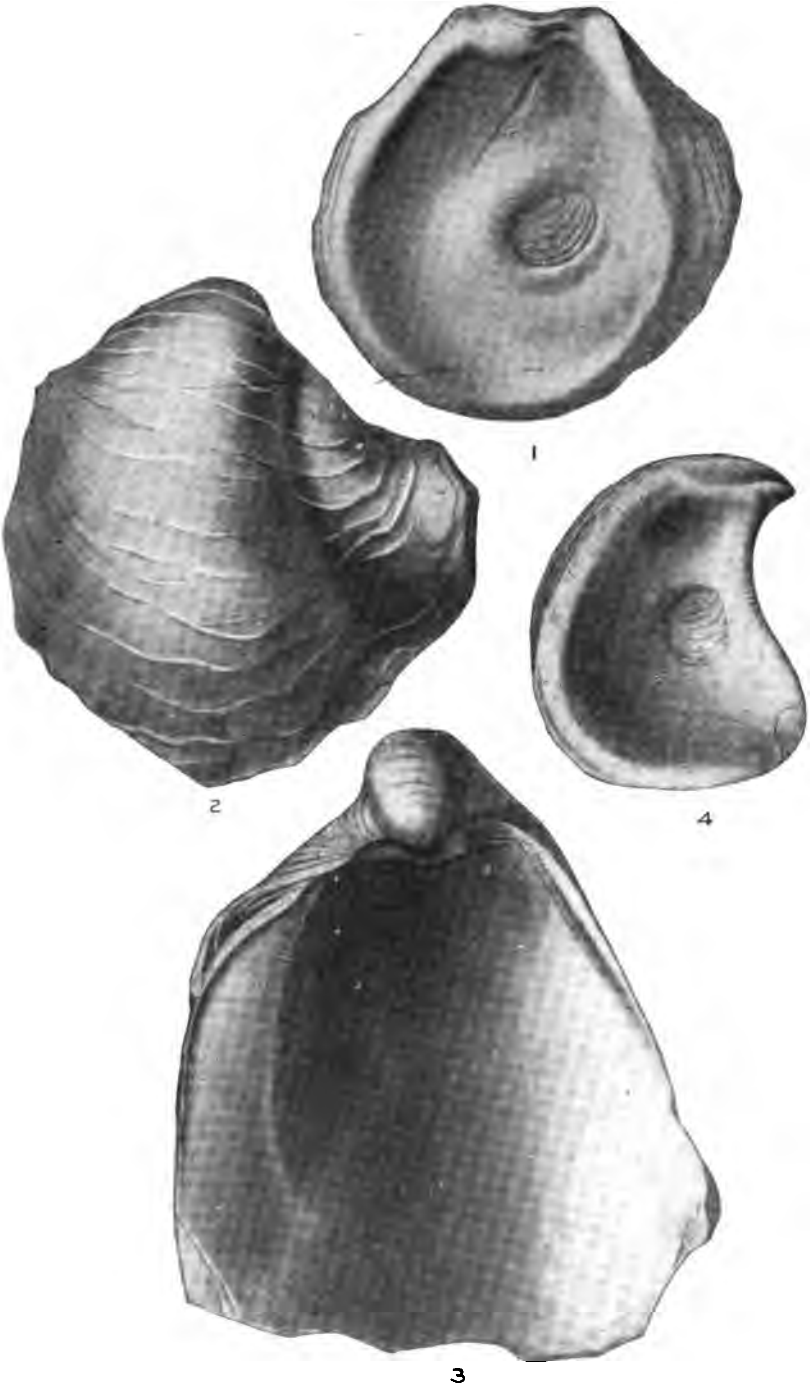
PLATE XVI.

Gryphæa corrugata Say (pp. 53–57).

Figs. 1, 2, 3. Copies of specimens figured by Prof. Jules Marcou under name of *Gryphœa dilatata* Sow. (Geology of North America, Zurich, 1858, Plate IV, figs. 1, 1*a*, and 3.)

Fig. 4. Copy of figure of *Gryphœa pitcheri* of Marcou = *G. navia* Hall. From same plate as above.

Figures natural size.



GRYPHÆA CORRUGATA Say = GRYPHÆA PITCHERI Marcou.

PLATE XVII.

PLATE XVII.

GRYPHÆA NAVIA Hall (pp. 57–59).

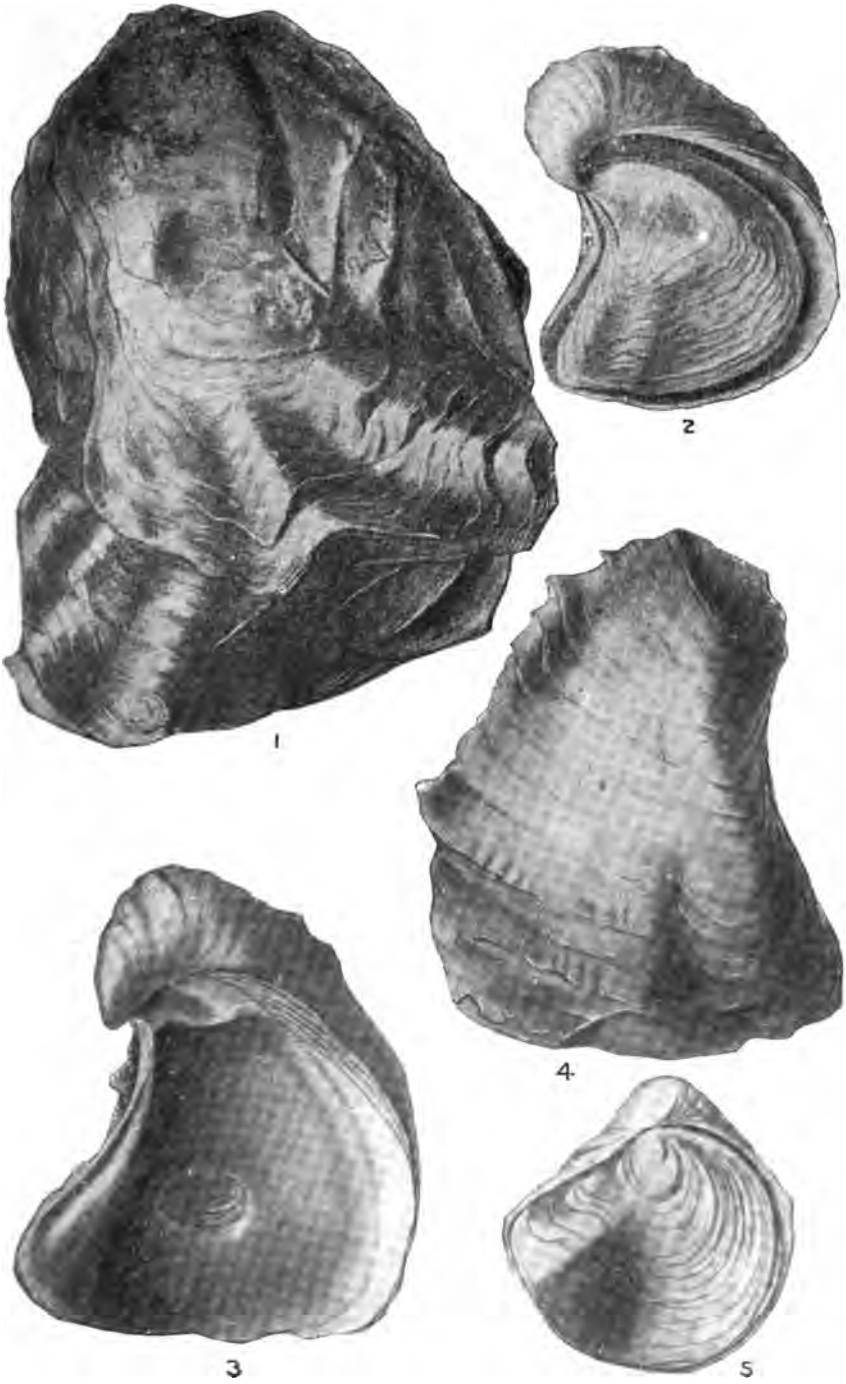
Fig. 1 is a copy of Professor Marcou's *Ostrea marshii* (= *O. subovata* Shumard). Found in association with *G. corrugata* Say in New Mexico, Kansas, and Texas.

Figs. 2–4. *Gryphœa pitcheri* Marcou = *G. navia* Hall.

Fig. 5. *Gryphœa dilatata*, var *tucumcarii* Marcou.

Copied from figures by Prof. Jules Marcou, Geology of North America, Zurich, 1858, Plate IV.

Figures natural size.



GRYPHÆA NAVIA Hall and O. SUBOVATA Shumard.

PLATE XVIII.

PLATE XVIII.

GRYPHÆA CORRUGATA Say (pp. 53–57).

Figs. 1–2. A young specimen of *G. corrugata* Say, for comparison with figures of *G. navia* Hall.

Fig. 3. A specimen from near Belvidere, Kansas. It appears to be intermediate between *G. corrugata* and *G. navia*. Note the slightly developed keel.

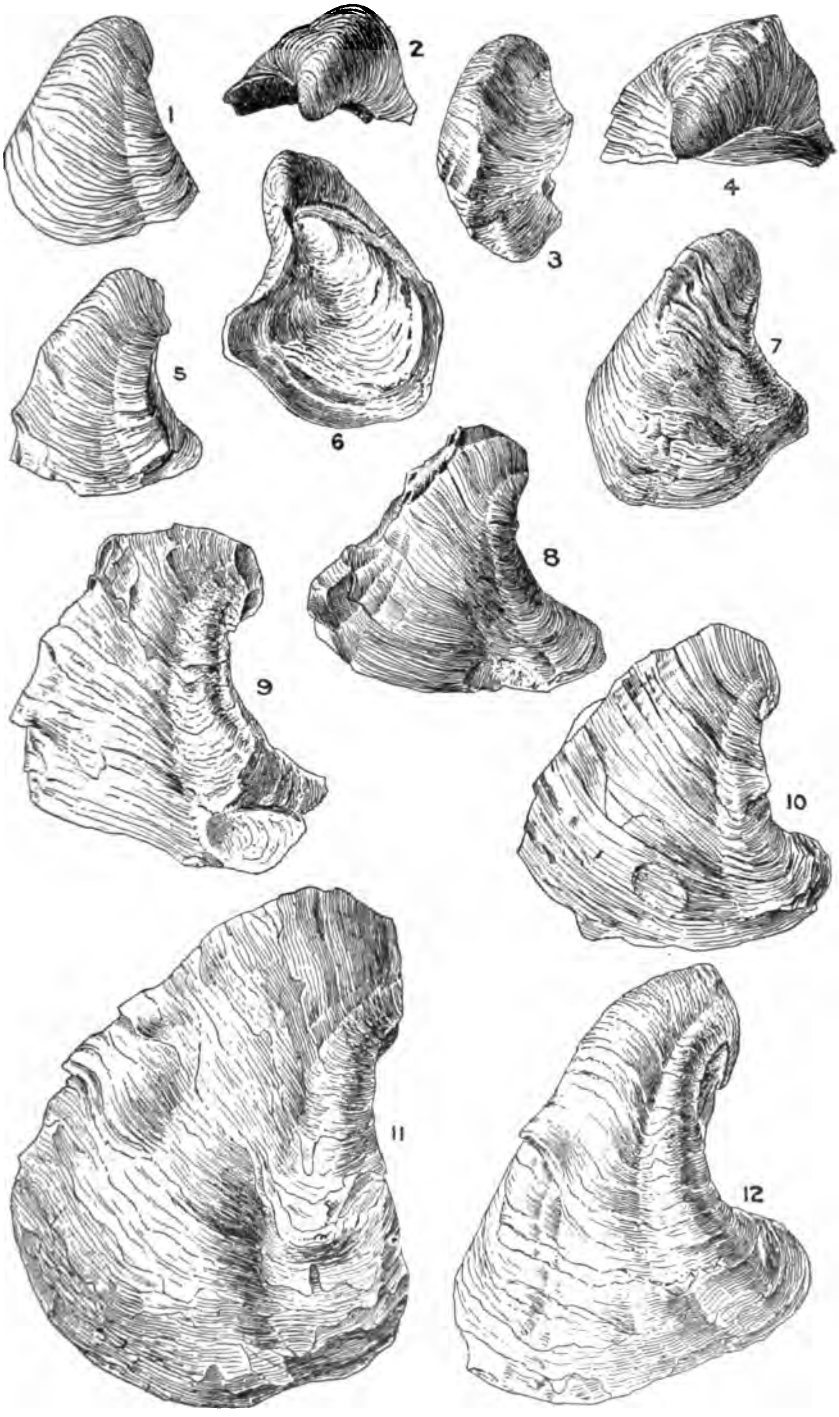
GRYPHÆA NAVIA Hall (pp. 57–58).

4. *Gryphæa navia* Hall, seen from above, to show that the young is like that of *G. corrugata*.

Figs. 5–11. Other specimens of *G. navia* Hall.

Fig. 12. A specimen from near Denison, Texas, that probably should be referred to *G. navia*.

All figures natural size.



GRYPHÆA NAVIA Hall.

PLATE XIX.

PLATE XIX.

PLATE XIX.

GRYPHÆA CORRUGATA Say (pp. 55–57).

Figs. 1–2. Figures of *Gryphæa corrugata* Say, for comparison with the figures of *G. washitaensis* Hill.

GRYPHÆA WASHITAENSIS Hill (pp. 59–62).

Figs. 3–19. *Gryphæa washitaensis* Hill. The specimens represented in figs. 3 and 5 have very little lateral expansion. These specimens come from the Duck Creek chalk north of Denison.

Fig. 4. *Gryphæa washitaensis* Hill, ordinary adult lower valve.

6. Prodissoconch and a little of the succeeding nepionic growth of *Ostrea virginica* Gmel., enlarged (after Jackson).

Figs. 7–9. Young upper valves of *Gryphæa washitaensis*, showing the prodissoconchs.

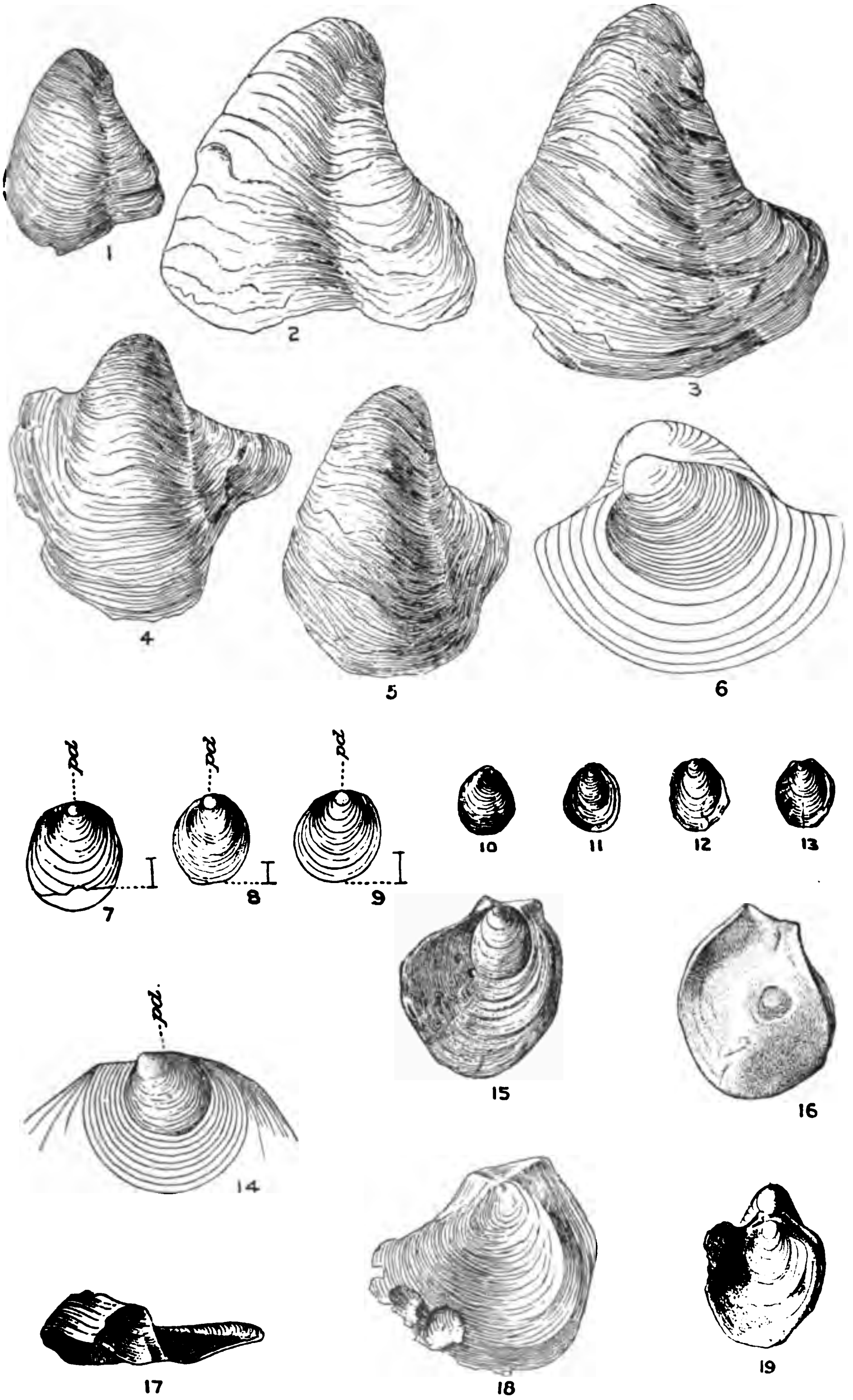
10–13. Illustrating the nepionic stage of the upper valves of *G. washitaensis.*

Fig. 14. The prodissoconch and a part of the nepionic growth of the same specimen represented in fig. 9, much enlarged.

Figs. 15–18. Upper valves of *G. washitaensis.* Note the distinctness with which the nepionic stage is marked off from the later growth. Fig. 16 is a reverse view of the specimen represented in fig. 15. Figs. 17–18 are two views of the same valve. Note the thickening on the ventral side in the anterior portion.

Fig. 19. *Gryphæa washitaensis.* The upper valve is still attached to the lower.

All figures are natural size except when otherwise indicated on plate.



GRYPHÆA CORRUGATA Say and G WASHITAENSIS Hill

PLATE XX.

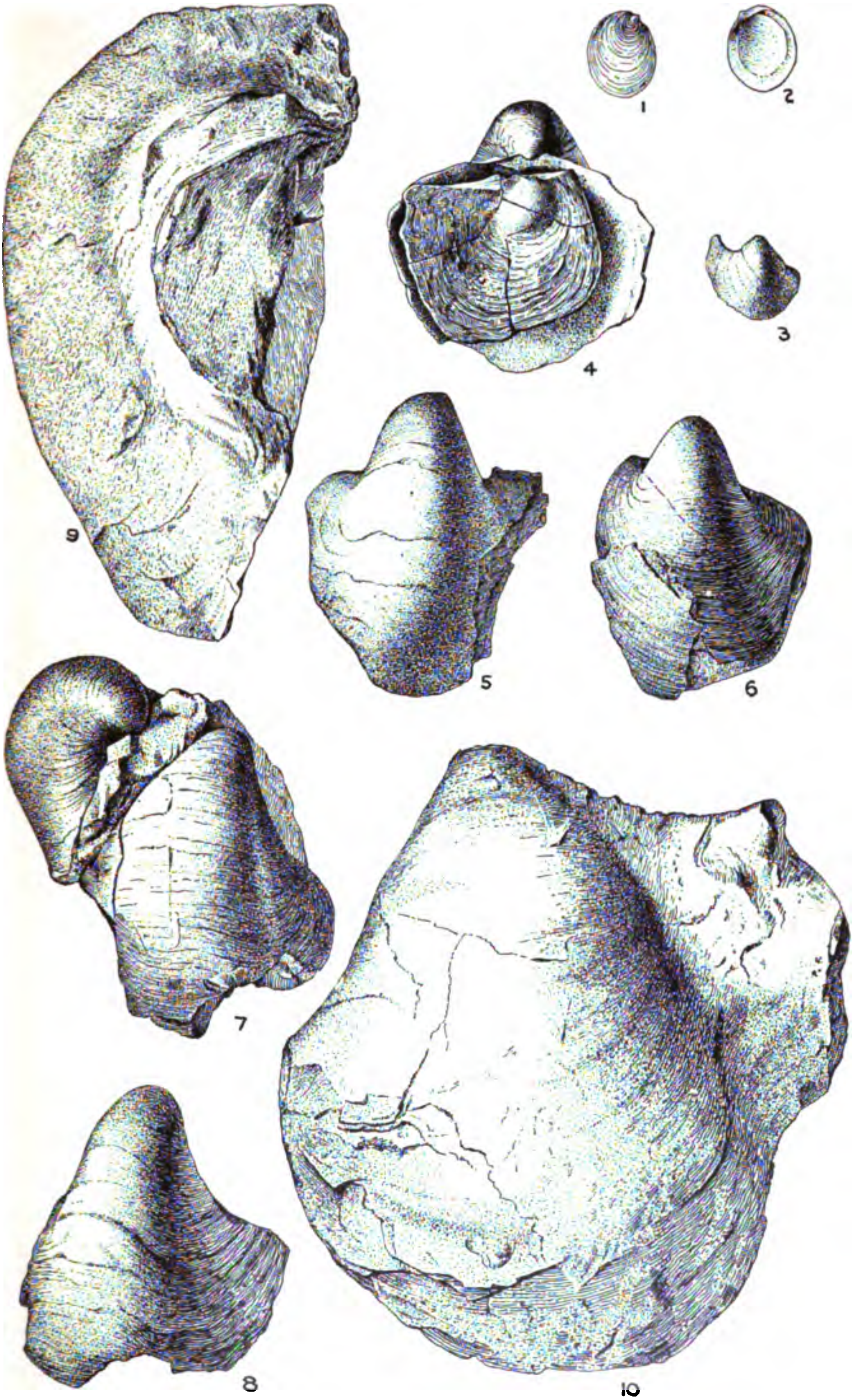
PLATE XX.

GRYPHÆA WASHITAENSIS Hill, lower valves (pp. 59–62).

Figs. 1–2. Two views of a young valve, showing the prodissoconch still attached. Note the presence of a few taxodont teeth on the dorsal side of the ligamental fossa in fig. 2.

3–8. Usual varieties.

9–10. Old forms, passing into the gerontic stage.



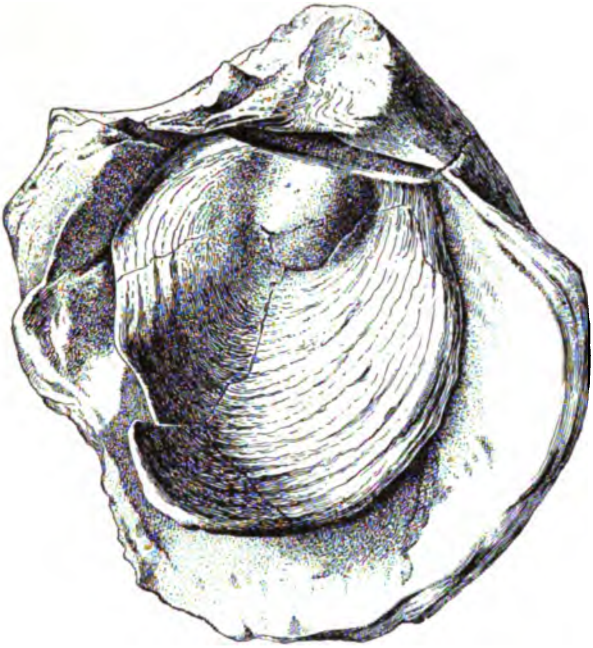
GRYPHÆA WASHITAENSIS Hill.

PLATE XXI.

PLATE XXI.

Gryphæa washitaensis Hill (pp 59–62).

Old form showing maximum development; natural size.



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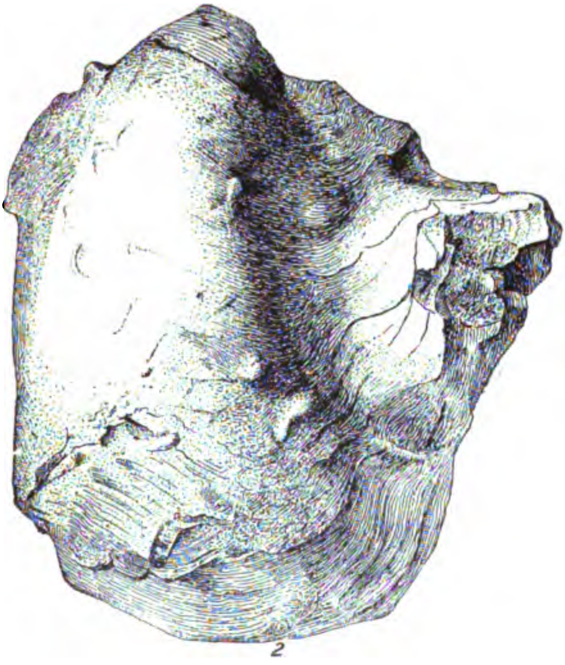


2

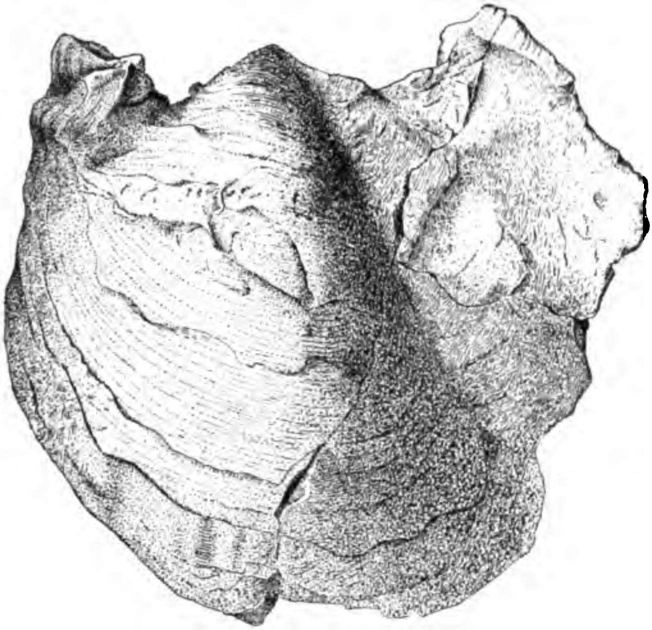
GRYPHÆA WASHITAENSIS Hill.

PLATE XXII.

PLATE XXII.

GRYPHÆA WASHITAENSIS Hill (pp. 59–62).

An old form, showing maximum development; two views of the same valve. Natural size.



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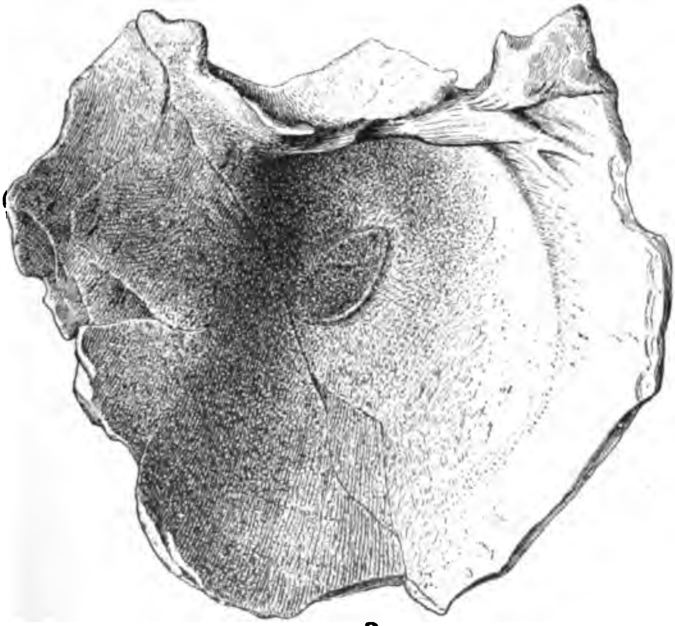


2

GRYPHÆA WASHITAENSIS Hill.

PLATE XXIII.

PLATE XXIII.

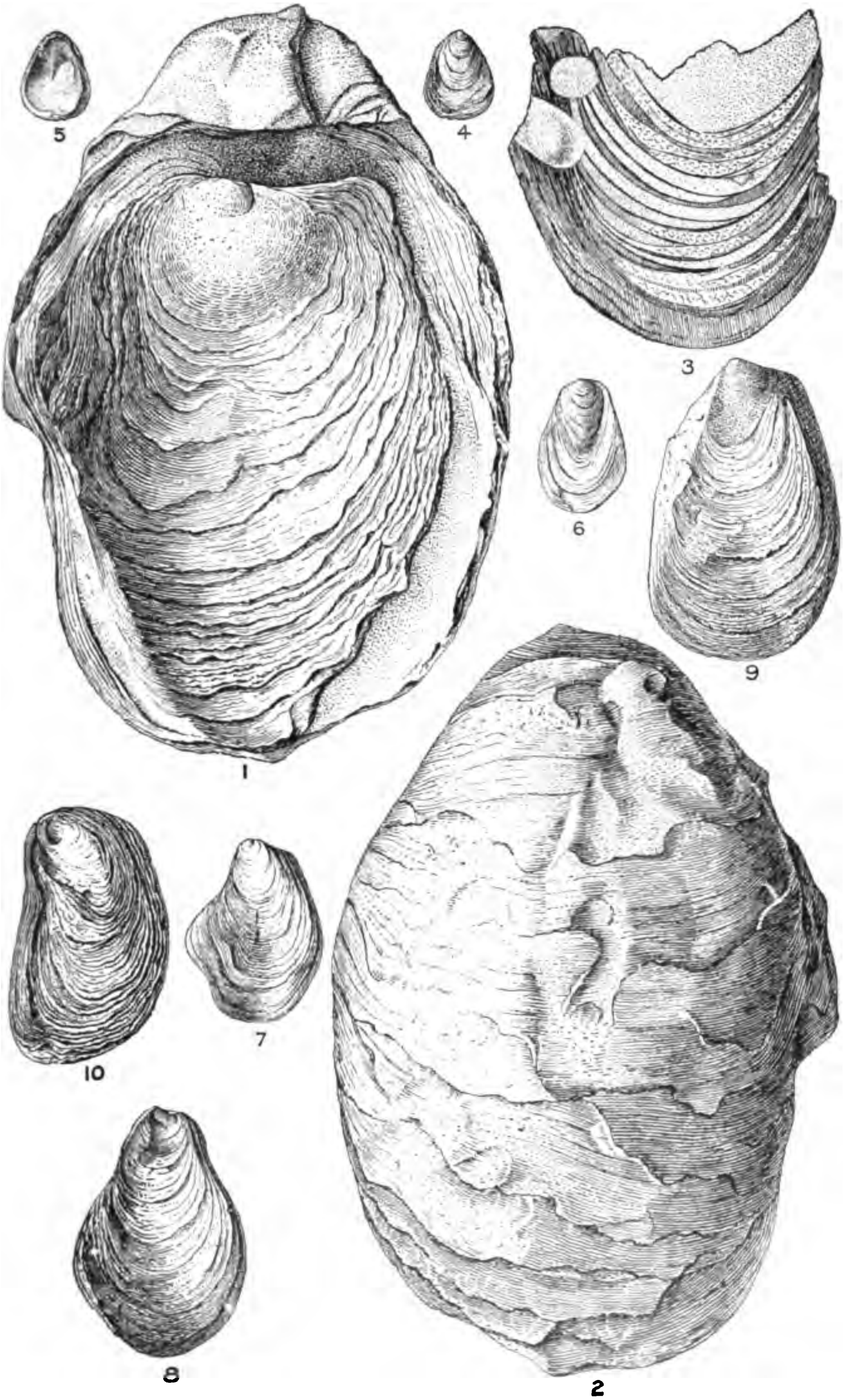
GRYPHÆA WASHITAENSIS Hill (pp. 59–62).

Figs. 1–2. A very old specimen of *Gryphæa washitaensis*, Hill; illustrates the extreme of the gerontic stage. This is the form called *Gryphæa gibberosa* by Cragin.

3. Section through a very old specimen of *G. washitaensis*.

GRYPHÆA MUCRONATA Gabb (pp. 63–65).

Figs. 4–10. Upper valves of *G. mucronata* Gabb. Note the nepionic stage in figs. 4, 6, and 7.



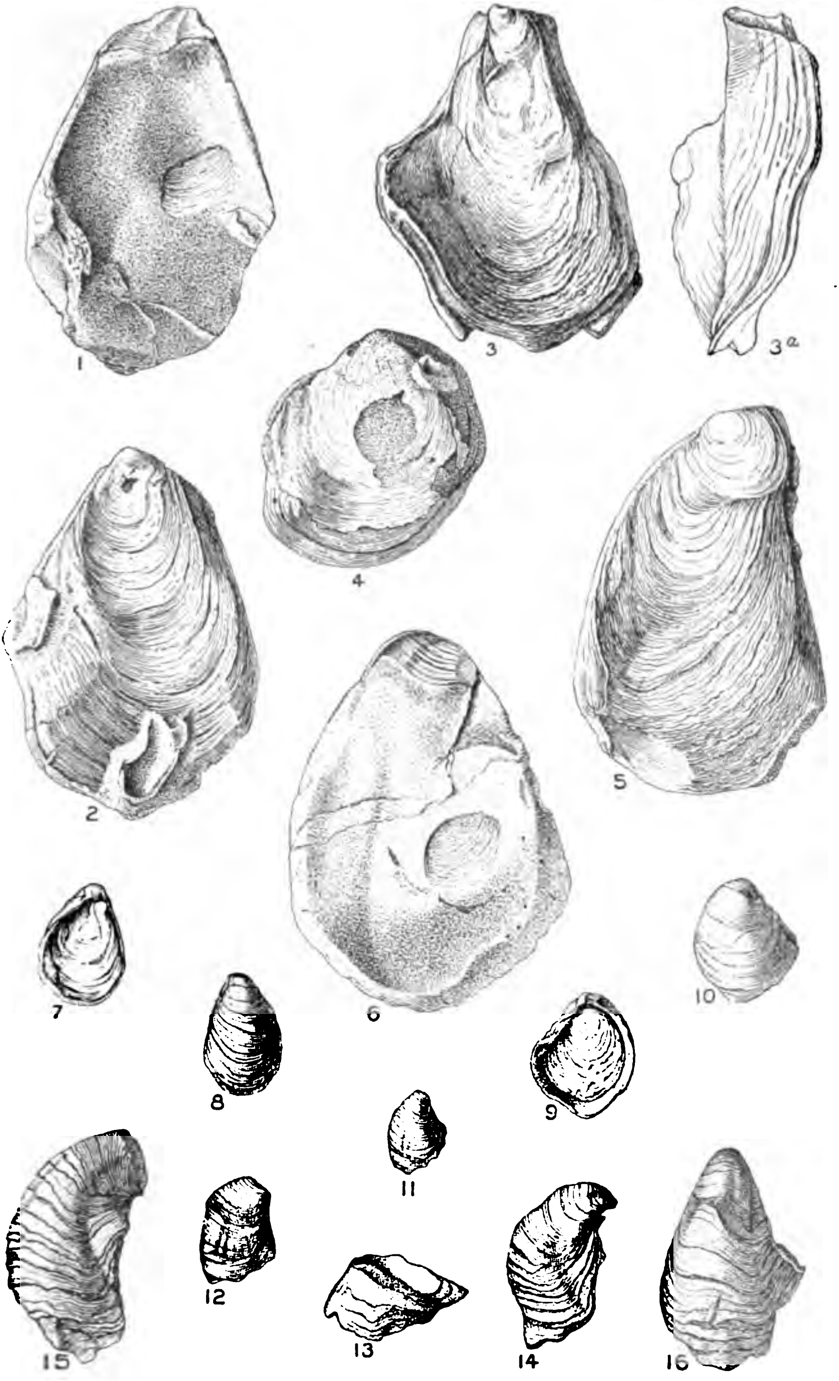
GRYPHÆA WASHITAENSIS Hill and G. MUCRONATA Gabb.

PLATE XXIV.

PLATE XXIV.

GRYPHÆA MUCRONATA Gabb, stages of development (pp. 63–65).

Figs. 1–6. Adult upper valves. Note the great thickening along the ventral margin in fig. 6*a*.
7–8. Two views of the same specimen (young).
9–10. Two views of the same specimen (young).
11–16. Young lower valves.
All figures natural size.

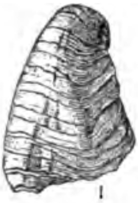


GRYPHÆA MUCRONATA Gabb

PLATE XXV.

PLATE XXV.

Gryphæa mucronata Gabb, lower valves (pp. 63–65); natural size.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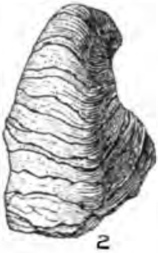
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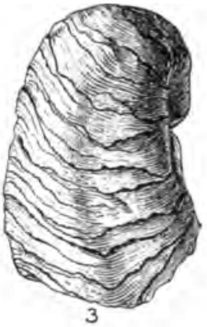
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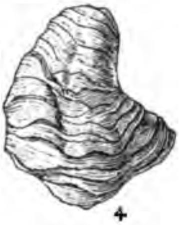
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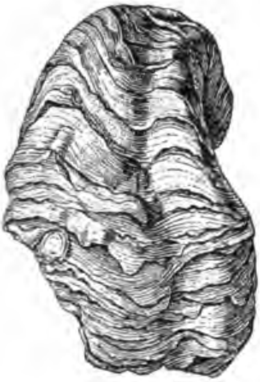
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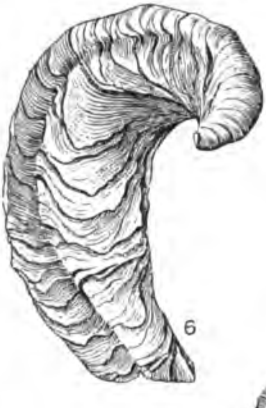
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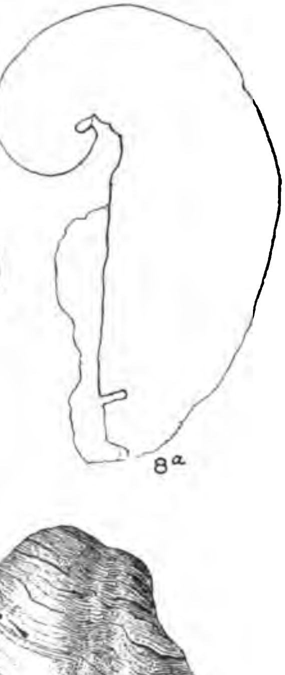
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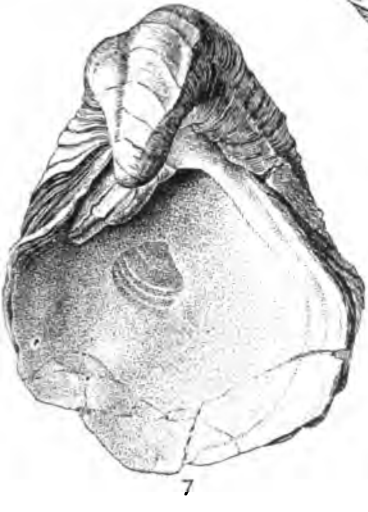
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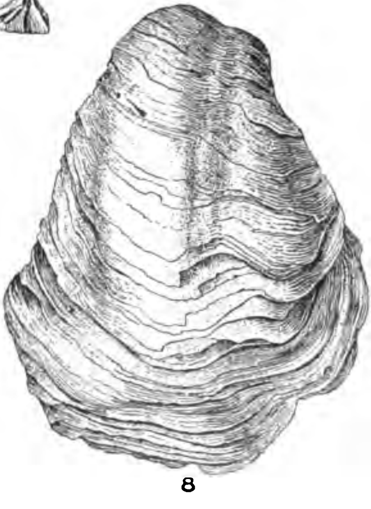

8

GRYPHÆA MUCRONATA Gabb.

PLATE XXVI.

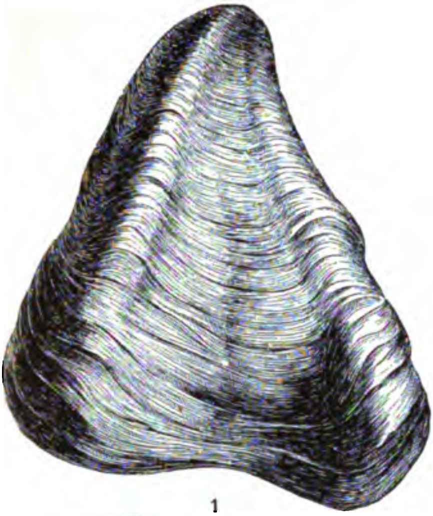
PLATE XXVI.

Gryphæa mucronata Gabb (pp. 63–65).

Figs. 1–3. Copies of Roemer's original figures of what he called *G. pitcheri.*

4–5. Clusters; the shells much distorted by their fixed condition of growth.

Figures natural size.



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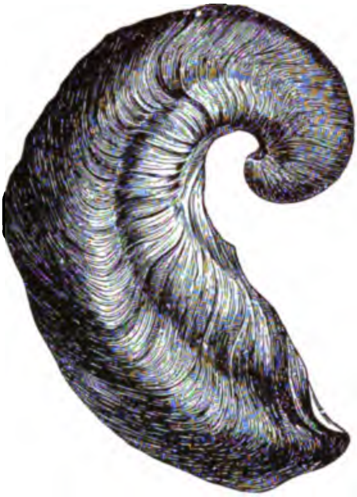

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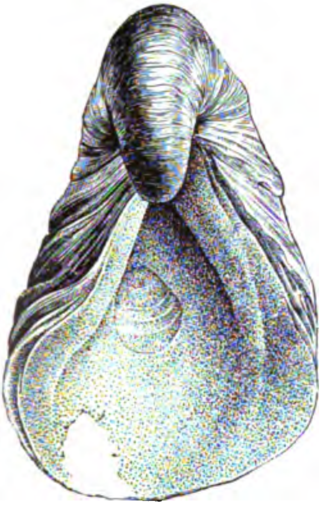

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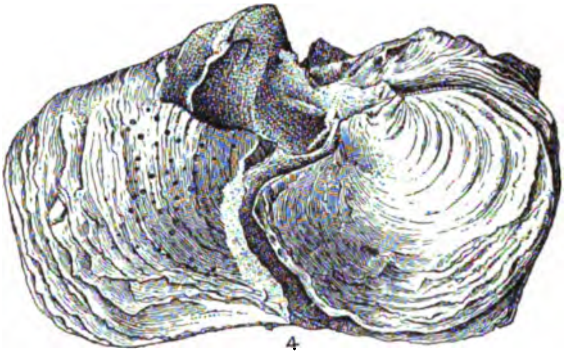

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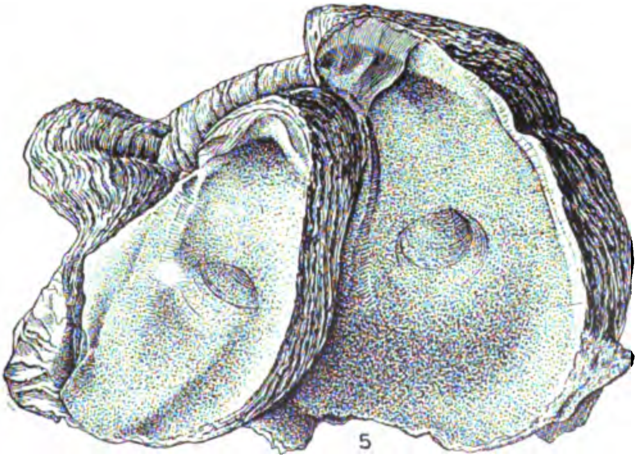


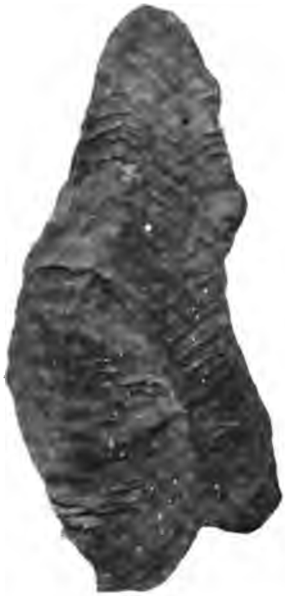
5

PLATE XXVII.

PLATE XXVII.

GRYPHÆA MUCRONATA Gabb. Elongate forms.

Figs. 1-5, together with all figures on Plates XXVIII-XXX, are intended to show the great variation in this species. All specimens from a single locality in the bluffs of Shoal Creek at Austin, Texas. Figures natural size.



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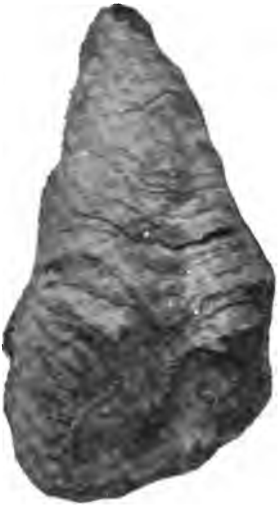

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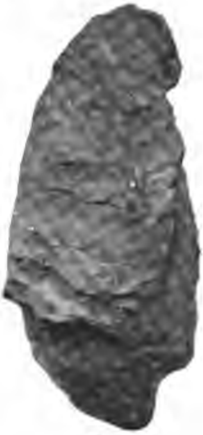

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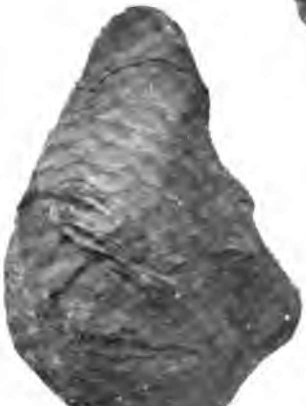

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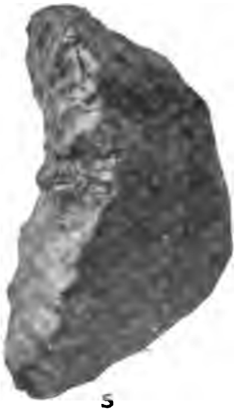


5

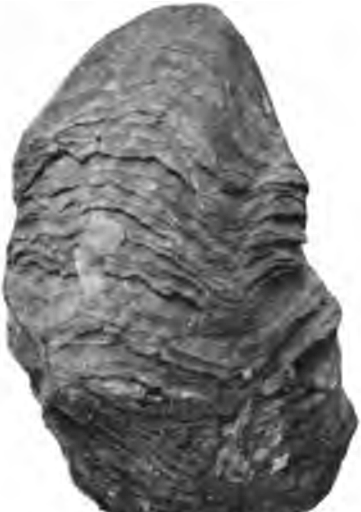
GRYPHÆA MUCRONATA Gabb.

PLATE XXVIII.

PLATE XXVIII.

Gryphæa mucronata Gabb (pp. 63–65).

Figs. 1–5. Normal forms; natural size.



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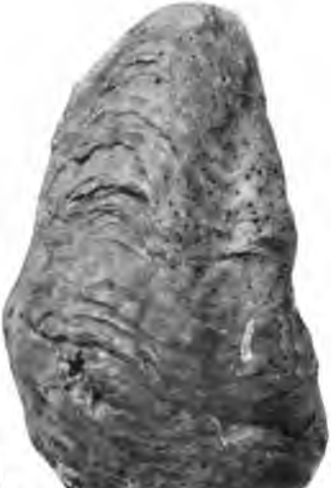

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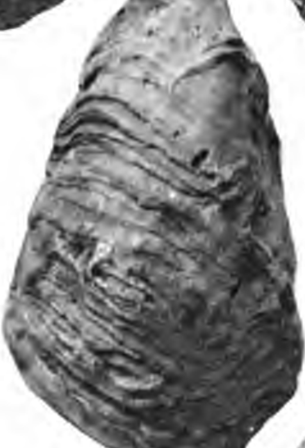

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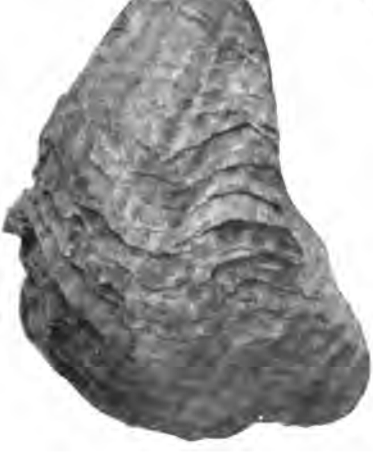

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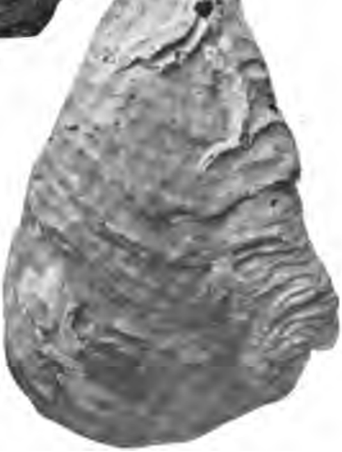


5

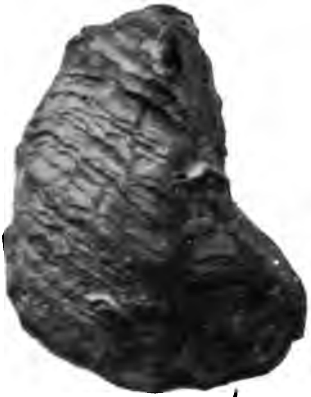
GRYPHÆA MUCRONATA Gabb.

PLATE XXIX.

PLATE XXIX.

GRYPHÆA MUCRONATA Gabb (pp. 63–65).

Figs. 1–6. Triangular forms; natural size.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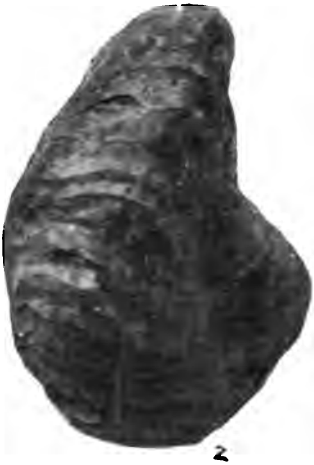
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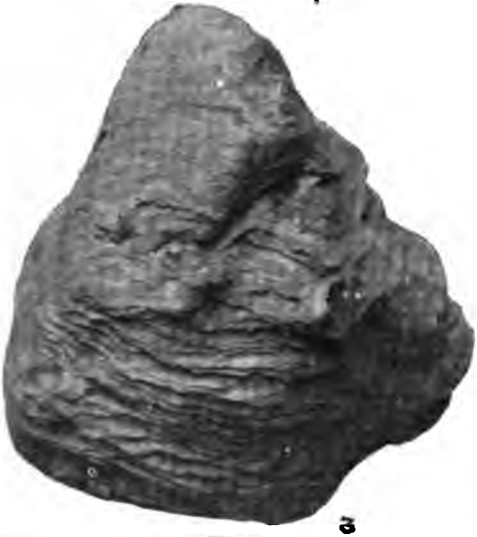
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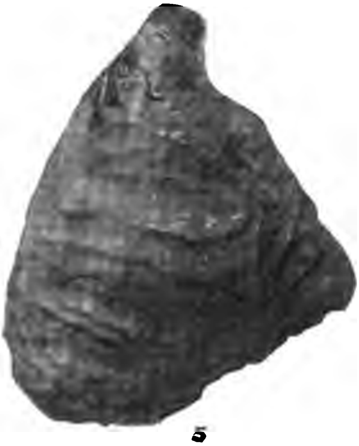
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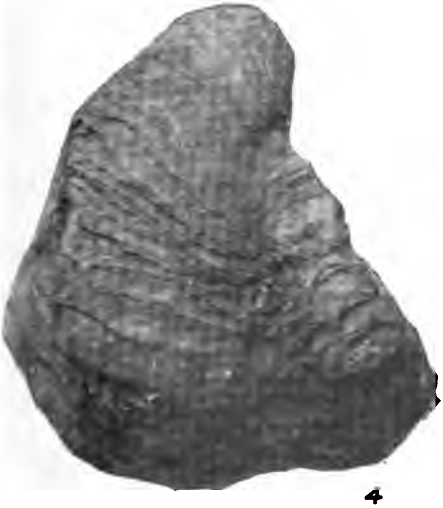
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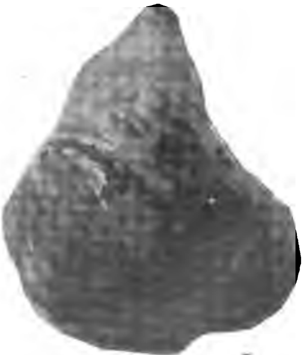

6

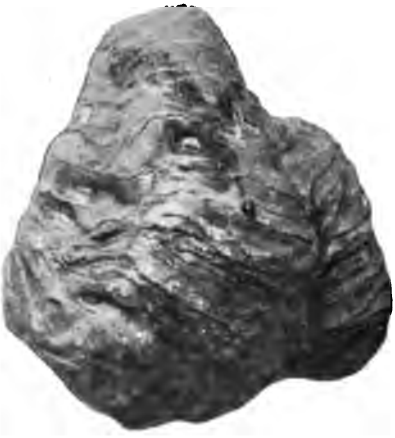
GRYPHÆA MUCRONATA Gabb.

PLATE XXX.

PLATE XXX

GRYPHÆA MUCRONATA Gabb (pp. 63–65).

Figs. 1–5. Attached forms; natural size.



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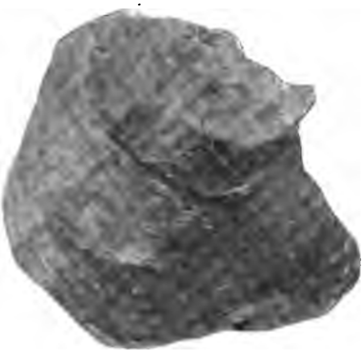

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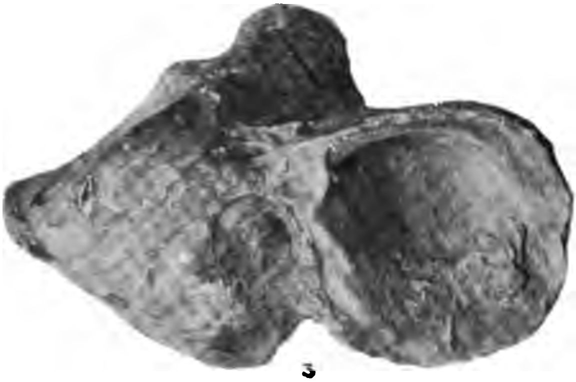

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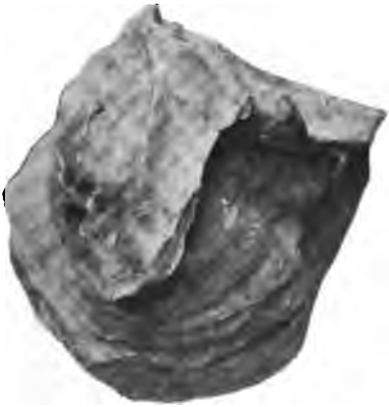

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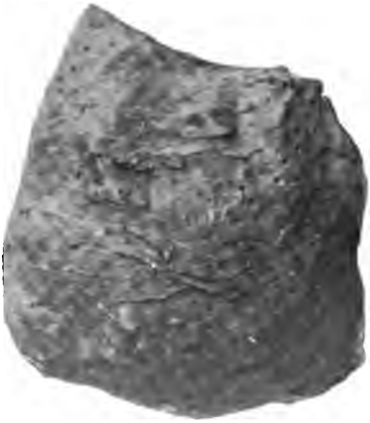

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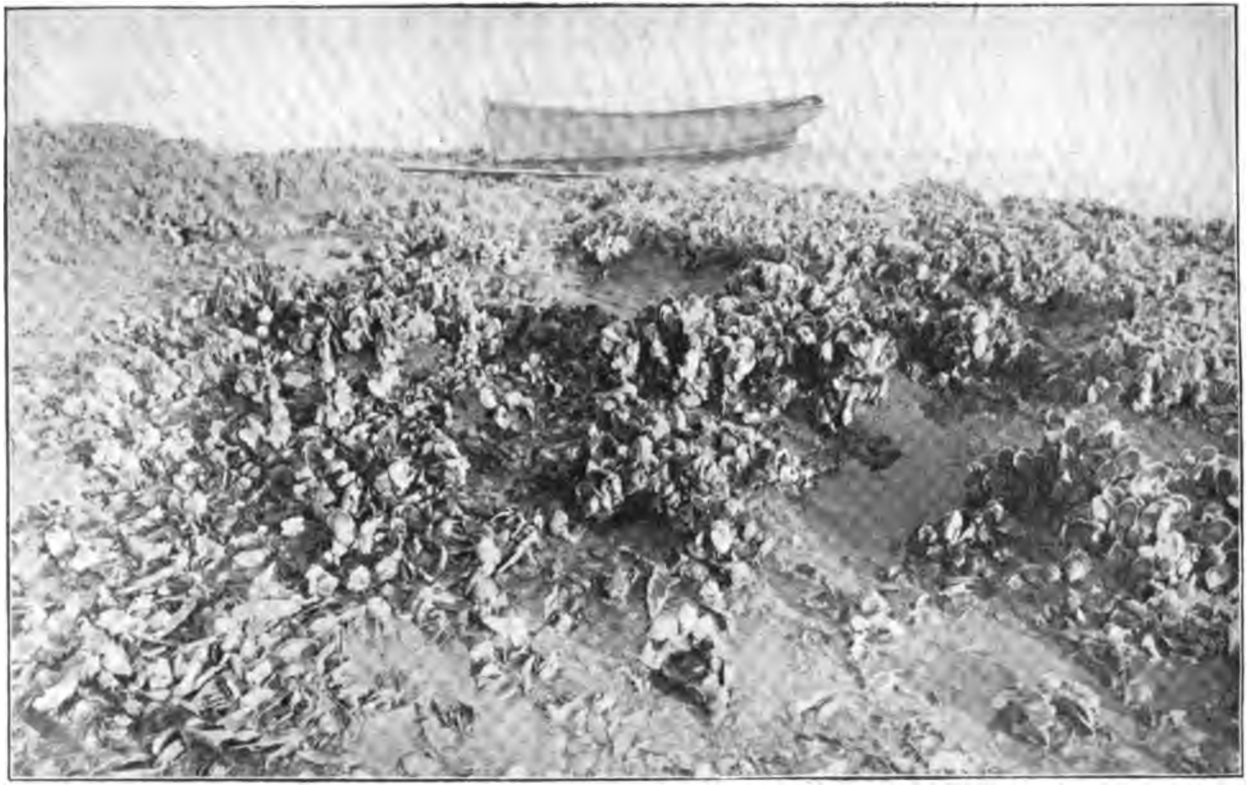
GRYPHÆA MUCRONATA Gabb.

PLATE XXXI.

PLATE XXXI.

View of a bed of living oysters 5 miles below Brunswick, Georgia; from a photograph by C. D. Walcott.

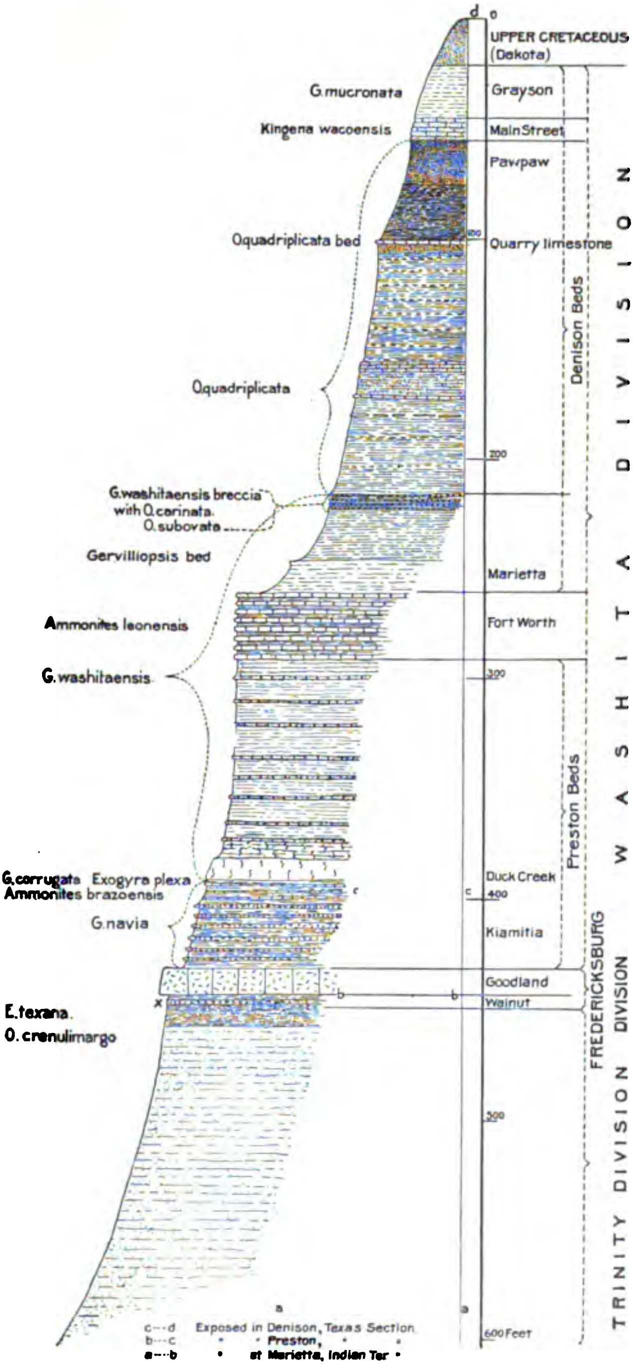


BED OF OYSTERS (OSTREA VIRGINICA).

PLATE XXXII.

PLATE XXXII.

Columnar section near Denison, Texas, showing stratigraphic occurrence of the fossil Ostreidæ in the Comanche series.

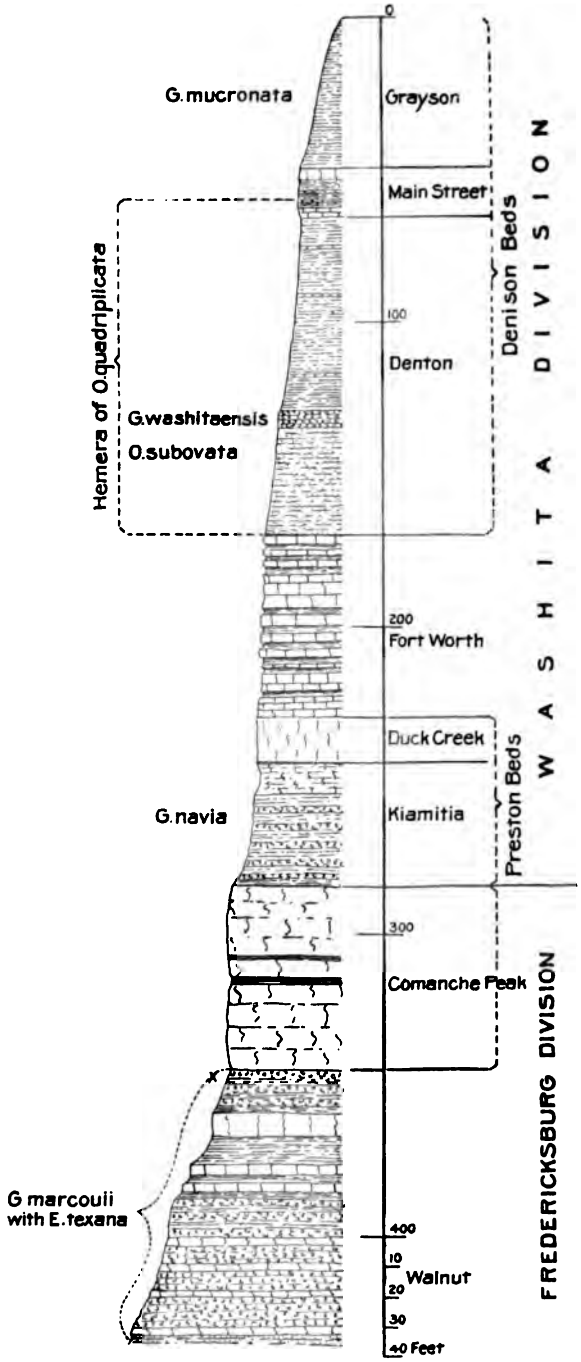


COLUMNAR SECTION NEAR DENISON, TEXAS

PLATE XXXIII.

PLATE XXXIII.

Columnar section near Fort Worth, Texas, showing stratigraphic occurrence of fossil Ostreidæ in the Comanche series.

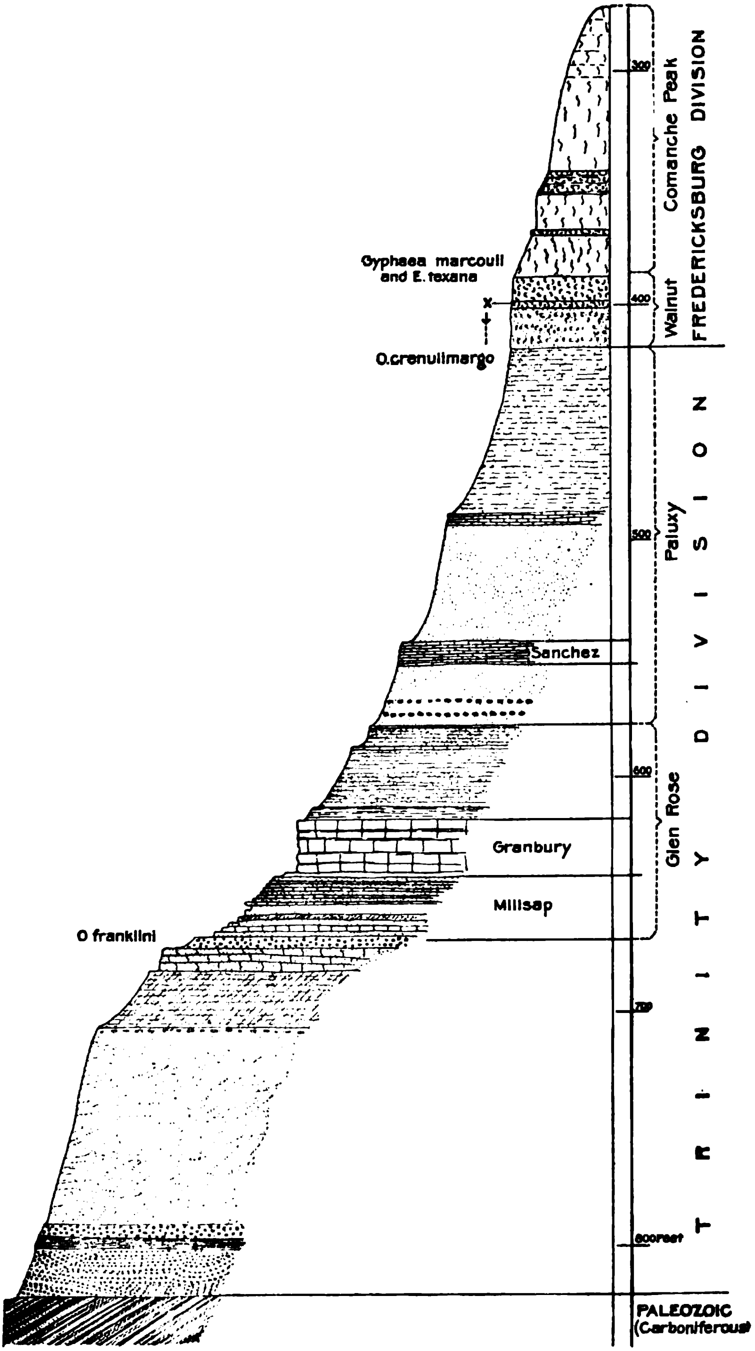


COLUMNAR SECTION NEAR FORT WORTH, TEXAS.

PLATE XXXIV.

PLATE. XXXIV.

Columnar section near Weatherford, Texas, showing occurrence of fossil Ostreidæ. This is the downward continuation of the section shown on Plate XXXIII.

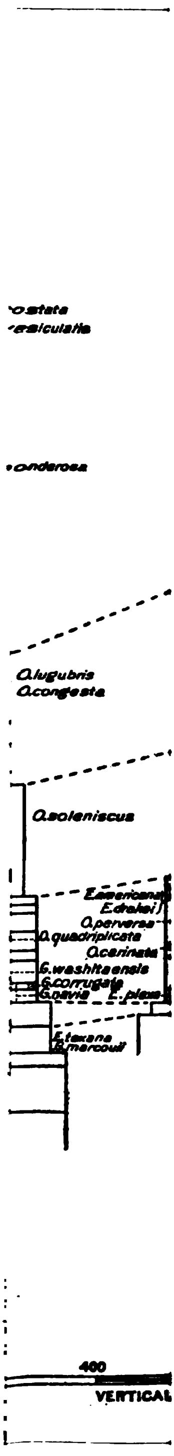


COLUMNAR SECTION NEAR WEATHERFORD, TEXAS

PLATE XXXV.

PLATE XXXV.

Table of columnar sections across the State of Texas and in New Mexico and Kansas, showing the vertical range and position of the Cretaceous Ostreidæ. Scale: 1 inch = 400 feet.



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[Bulletin 151.]

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On March 2, 1895, the following provision was included in an act of Congress:

"*Provided*, That hereafter the report of the mineral resources of the United States shall be issued as a part of the report of the Director of the Geological Survey."

In compliance with this legislation the following reports have been published:

Mineral Resources of the United States, 1894, David T. Day, Chief of Division. 1895. 8°. xv, 646 pp., 23 pl.; xix, 735 pp., 6 pl. Being Parts III and IV of the Sixteenth Annual Report.

Mineral Resources of the United States, 1895, David T. Day, Chief of Division. 1896. 8°. xxiii, 542 pp., 8 pl. and maps; iii, 543–1058 pp., 9–13 pl. Being Part III (in 2 vols.) of the Seventeenth Annual Report.

Mineral Resources of the United States, 1896, David T. Day, Chief of Division. 1897. 8°. xii, 642 pp., 1 pl.; 643–1400 pp. Being Part V (in 2 vols.) of the Eighteenth Annual Report.

The report on the mineral resources for the calendar year 1897 will form a part of the Nineteenth Annual Report of the Survey.

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UNITED STATES GEOLOGICAL SURVEY,
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OF THE

UNITED STATES GEOLOGICAL SURVEY

No. 152

A CATALOGUE OF THE CRETACEOUS AND TERTIARY PLANTS
OF NORTH AMERICA.—KNOWLTON

WASHINGTON
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1898

UNITED STATES GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

A CATALOGUE

OF THE

Cretaceous and Tertiary Plants of North America

BY

FRANK HALL KNOWLTON

WASHINGTON
GOVERNMENT PRINTING OFFICE
1898

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
Washington, D. C., January 12, 1898.

SIR: I have the honor to transmit herewith the manuscript of a catalogue of the Cretaceous and Tertiary plants of North America, and to request its publication as a bulletin of the Survey.

Very respectfully, yours,

F. H. KNOWLTON,
Assistant Paleontologist.

Hon. CHARLES D. WALCOTT,
Director United States Geological Survey.

A CATALOGUE OF THE CRETACEOUS AND TERTIARY PLANTS OF NORTH AMERICA.

By F. H. KNOWLTON.

INTRODUCTION.

This catalogue of the Cretaceous and Tertiary plants of North America is the outcome of the author's personal needs, and is presented, even in its present somewhat imperfect form, in the hope that it may be of assistance to other workers in this field.

The first catalogue of approximately this scope was published by Prof. Leo Lesquereux in the Tenth Annual Report of the United States Geological and Geographical Survey of the Territories[1] under the title Catalogue of the Cretaceous and Tertiary Plants of North America, with References to the Descriptions. In this catalogue the species are arranged in botanical sequence. The Cretaceous flora embraced only 157 species and the Tertiary flora 549 species, or a total of 706 for these two great geological systems. As a proof of the rapid growth of paleobotanical knowledge in this country during the twenty-one years between that and the present enumeration, it may be stated that the Potomac flora alone now numbers more species than the total Cretaceous and Tertiary floras known to Lesquereux, and that the flora of the Dakota group has more than twice as many species (460) as the whole Cretaceous had, as then known.

The only other catalogue is that of S. A. Miller, published in 1881 under the title North American Mesozoic and Cænozoic Geology and Palæontology; or, An Abridged History of Our Knowledge of the Triassic, Jurassic, Cretaceous, and Tertiary Formations of this Continent. This is hardly more than a crude compilation from that of Lesquereux and certain publications that had appeared between the date of that and the year 1881.

A number of lists without references or synonymy have been published which embrace simply the names and in some cases the distribution of the species—such, for example, as Lesquereux's "Table of distribution of the species of fossil plants in the Tertiary formations of North America;"[1] a list under the same title in the following volume;[2] a "Table showing the geographical distribution of the fossils of the Laramie group, collected during the season of 1877;"[3] "A table of distribution of the plants of the Cretaceous Cenomanian formation;"[4] "Table of distribution of the species of the Laramie group;"[5] "Table of distribution of the plants of the Green River and White River group;"[6] "Table of distribution of North American Miocene fossil plants;"[7] "Table showing the distribution of the plants of the Dakota group;"[8] Lester F. Ward: "Table of distribution of Laramie, Senonian, and Eocene plants,"[9] etc.

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[1] Washington, 1876 [1878], pp. 487–520.

In the present catalogue the entire flora is arranged in a single alphabetical sequence. This arrangement precludes the duplication of species which may occur in more than one formation, and is, moreover, easier of use than when the species are arranged according to botanical affinities.

I have given for each genus the original date and place of publication. In the case of the exclusively fossil genera much care has been expended in verifying these points, and while it is too much to expect that all are absolutely correct, it is hoped that the errors will prove to be few. For the living genera that have also been found fossil, the date and place of publication have been taken mainly from the Kew Index and have not in all cases been verified. The dates of these later genera are not, however, of great importance in the present connection, since botanists are not agreed as to the date that shall be taken as the initial point for genera. One school would make the introduction of binomial nomenclature, or the publication of Linnæus's Species Plantarum, 1753, as the initial point for both genera and species, while another school would take the publication of Linnæus's Systema, in 1735, as the starting point for genera. Other botanists would go still further back to Tournefort, who has been called the father of genera, or even to the remote place in literature when a genus was first printed, no matter in what connection. It would seem wise, therefore, to settle on some important date as the initial point. For convenience the date selected in the Kew Index—1735—is here taken for the living genera. Fortunately the science of paleobotany is so young that all of the generic names that have been given in it are of later date than any of the dates in controversy, since all are later than 1800.

In the case of species, the original place and date of publication have been given in all instances. This is followed by several of the most important references, especially such as refer to descriptions and figures, but no attempt has been made to make it absolutely complete, since to have done this would have greatly increased the labor of compilation without adding much to its value as a catalogue. The original and, for sake of convenience, most important references are given.

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[1] Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., pp. 307-309, 1871 [1872].

[2] Op. cit., pp. 410-417 (1872 [1873]).

[3] Op. cit., pp. 255 (1877 [1879]).

[4] Cret. and Tert. Fl., pp. 93-103 (1883).

[5] Op. cit., pp. 115-120.

[6] Op. cit.. pp. 206-212.

[7] Op. cit., pp. 266-272.

[8] Monogr. U. S. Geol. Surv., XVII, pp. 222-225, 1891.

[9] Sixth Ann. Rept. U. S. Geol. Surv., pp. 443-514, 1886.

When the species is a foreign one the original reference is given, followed by a reference to the first place where it is recorded as belonging to our flora. Then follow the references to figures and descriptions, if there be any, relating to its North American history.

The synonymy is placed in proper order under the species to which it belongs. Each synonym is, however, entered in its proper alphabetical place, followed by an indication of the form to which it is now referred. Thus: "Ficus ? fimbriata Lx.=Eremophyllum fimbriatum."

In the numerous reports on fossil plants published in the Annual Reports of the Hayden Survey, Lesquereux described many species supposed to be new to science, and also identified numerous foreign species, that were never afterwards alluded to by him. There are probably more than 100 species coming under this heading that are not entitled to recognition as belonging to our flora. These new or foreign species were described or identified from time to time in these preliminary reports, but when Lesquereux came to study them more carefully, in preparing them for the final monographs, they were discarded or merged into other species, and no record was made of such disposition. They stand, therefore, in the books as valid species, while in reality they are hardly more than nomina nuda. The specimens upon which they were based are now lost or embraced under other names in such a way that there is absolutely no connection between them. In the following catalogue these species have been indicated by a bracketed statement at the end. Thus: "Quercus Goldianus Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 398 (1873 [1874]). [Not recognized by its author after first description.]"

No attempt has been made in this catalogue to give an absolutely complete account of the geographical distribution of the various species. It would have required a monographic revision of each species to determine accurately its areal distribution, and such a work was not contemplated at the present time. The distribution here given is taken mainly from the books, with little or no revision, and while it is undoubtedly correct in a large majority of cases, it is not to be taken as absolutely so. One of the tasks of the future will be to work out more completely the geographical distribution of our flora.

In similar manner, the geological distribution as here given is not to be taken as final. It is compiled from the books in most cases, and while it has been given as completely and as accurately as was possible under the circumstances, it is constantly changing to accord with the changes in the conception of the various geological horizons. As an example, the plant-bearing horizon at Point of Rocks, Wyoming, had always been referred to the true Laramie, until it was found, in 1896,[1] that it was below well-defined marine Cretaceous, and hence in the Montana formation.

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[1] See Stanton and Knowlton: Bull. Geol. Soc. Am., Vol. VIII, pp. 127-156.

Another source of uncertainty results from the disagreement among geologists and paleontologists as to the age of various beds. Thus, by some the Fort Union beds are regarded as Cretaceous and by others as Tertiary, and the so-called "Arctic Miocene" is coming to be regarded as Eocene. When it has been possible, without circumlocution, the horizon has been indicated in a way that will fix its relative position without going too far. Thus the use of the Belly River series, Denver beds, Fort Union beds, Amboy clays, Potomac formation, etc., indicates sufficiently the geological position, without attempting a discrimination perhaps unwarranted by the present state of our knowledge. But above all it should be remembered that this is an attempt at a catalogue of our Cretaceous and Tertiary plants, and is not intended as a complete exposition of their geographical or geological distribution.

No arbitrary signs or characters have been used in this work. In a few cases it was found necessary to give new names on account of the old name being preoccupied. In such cases the new name is followed by "nom. nov." In accordance with principles quite generally adopted among recent botanists, the attempt is made in this catalogue to restore the oldest specific name under which a species was described. This has resulted in a number of new combinations, which are indicated by the abbreviation "n. comb." In the case of two dates given for a publication (e. g., Fl. Amboy Clays, 1895 [1896]) the first is the title-page date, the bracketed date being the actual date of issue.

The bibliography consists simply of a list of the North American works and papers that have been consulted in preparing this catalogue, together with such others as contain original descriptions of our plants. It was not thought worth while to give a bibliography of the references to the numerous foreign species that have been identified in our flora, with the single exception of those found in the various parts of Heer's Flora Fossilis Arctica.

In conclusion, I beg to acknowledge my indebtedness to Prof. Lester F. Ward for valuable suggestions, use of books, etc., and to his assistant, Miss C. H. Schmidt, for assistance in catologuing and verifying references.

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—— Fossil cycadean trunks of North America, with a revision of the genus Cycadeoidea Buckland.

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CATALOGUE.

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Pleistocene: Scarboro Heights, Ontario.

Abies Linkii Rœm.=Abietites Linkii.

Abies nevadensis Lx.=Taxodium distichum miocenum.

Abies setiger Lx.=Abietites setiger.

ABIETITES Hisinger. Lethæa suecica, p. 110, 1837.

Abietites angusticarpus Font. Potomac Fl., p. 263, pl. cxxxiii, f. 1, 1889.
Potomac formation: Fredericksburg, Virginia.
Horsetown beds: Shasta County, California.

Abietites californicus Font. In Diller and Stanton, Bull. Geol. Soc. Am., vol. v, p. 450, 1894. Nomen nudum.
Horsetown beds: Shasta County, California.

Abietites dubius Lx. Am. Journ. Sci., vol. xlv, p. 207, 1868; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 196, 1869 [reprint 1873]; Tert. Fl., p. 81, pl. vii, f. 24 [non f. 20, 21, 21*a*], 1878.
Livingston beds: Bozeman coal field, Montana.
Laramie group: Raton Mountains, New Mexico.
———: Upper Kanab Valley, Utah.

Abietites dubius Lx., Tert. Fl., pl. vi, f. 20, 21, 21*a*=Sequoia Reichenbachi.

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Potomac formation: Fredericksburg, Virginia.

Abietites ernestinæ Lx. Cret. Fl., p. 49, pl. i, f. 7, 1874.
Pterophyllum Haydenii ex. p. Lx. Am. Journ. Sci., vol. xlvi, p. 91, 1868.
Dakota group: Decatur, Nebraska.

Abietites Linkii (Rœm.) Dunk. Monogr. d. Norddeutschen Wealdenb., p. 18, pl. ix, f. 11*a–c*, 1846; Font., Proc. U. S. Nat. Mus., vol. xvi, p. 268, pl. xxxvii, f. 2, 1893.
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Trinity division: Glenrose, Texas.

Abietites macrocarpus Font. Potomac Fl., p. 262, pl. cxxxii, f. 7, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Abietites setiger Lx. Tert. Fl., p. 82, pl. vii, f. 17, 18, 1878.
Abies setiger Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 404, 1872 [1873]. Probably rootlets.

Abietites Tyrrellii Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 17, 1885 [1886].
Fort Pierre: Berry Creek, Northwest Territory.

Abietites sp., Font. Proc. U. S. Nat. Mus., vol. xvi, p. 277, pl. xliii, f. 4, 1893.
Trinity division: Glenrose, Texas.

Abietitis sp., Font. In Diller and Stanton, Bull. Geol. Soc. Am., vol. 5, p. 450, 1894.
Knoxville beds: Tehama County, California.

ACACIA Adanson. Fam., pl. ii, p. 319, 1763.

Acacia oregoniana Lx. Proc. U. S. Nat. Mus., vol. xi, p. 14, pl. v. f. 4, 1888.
Miocene: John Day Valley, Oregon.

Acacia septentrionalis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 418, 1873 [1874]; Tert. Fl., p. 299, pl. lix, f. 9, 9*a*, 1878.
Green River group: Castello's ranch, Colorado.

ACACIÆPHYLLUM Fontaine. Potomac Fl., p. 279, 1889.

Acaciæphyllum longifolium Font. Potomac Fl., p. 279, pl. cxxxvii, f. 6; cxxxviii, f. 1–3, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

Acaciæphyllum microphyllum Font. Potomac Fl., p. 280, pl. cxxxviii, f. 5, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Acaciæphyllum spatulatum Font. Potomac Fl., p. 280, pl. cxxxviii, f. 4, 6–9, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

Acaciæphyllum variabile Font. Potomac Fl., p. 281, pl. clxx, f. 7, 1889.
Potomac formation: Baltimore, Maryland.

ACER (Tournefort) Linnæus. Gen. pl., p. 112, 1737.

Acer æquidentatum Lx. Tert. Fl., p. 262, pl. xlviii, f. 1, 3, 1878; Mem. Mus. Comp. Zoöl. vol. vi, p. 26, pl. vii, f. 4, 5, 1878.
Laramie group?: Carbon, Wyoming.
Miocene: Auriferous gravels, California.
Green River group?: White and Green rivers.

Acer amboyense Newby. Fl. Amboy Clays, p. 106, pl. xlvi, f. 5–8, 1895 [1896].
Amboy clay: Woodbridge, South Amboy, New Jersey.

Acer arcticum Heer. Fl. Foss. Arct., vol. iv, abt. i, p. 86, pl. xxii; xxiii; xxiv, f. 1, 2; xxv, f. 1–3, 1877; Lesquereux, Mem. Mus. Comp. Zoöl., vol. vi, p. 60, 1878.
Fort Union group: Bad Lands, Dakota.
Miocene: Oregon Creek, 20 miles north of Chalk Bluffs, California.

Acer Bendirei Lx. Proc. U. S. Nat. Mus., vol. xi, p. 14, pl. v, f. 5; pl. vi, f. 1; pl. vii, f. 1; pl. viii, f. 1, 1888.

Acer trilobatum productum Al. Br. Lesquereux. Cret. and Tert. Fl., 253, p. pl. lix, f. 1-4, 1883.

Miocene: John Day Valley, Oregon.

Miocene: Spanish Ranch, California.

Acer Bolanderi Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 27, pl. vii, f, 7-11, 1878.

Miocene: Table Mountain, California.

Acer dimorphum Lx. Proc. U. S. Nat. Mus., vol. xi, p. 15, pl. ix, f. 1, 1888.

Miocene: John Day Valley, Oregon.

Acer gracilescens Lx. Cret. and Tert. Fl., p. 234, pl. xlix, f. 7 (6?), 1883.

Fort Union group: Bad Lands, Dakota.

Acer indivisum Web. Palæontogr., vol. ii, p. 198, pl. xxii, f. 2*a*, 2*b*, 1852; Ward, Bull. U. S. Geol. Surv., no. 37, p. 66, pl. xxix, f. 5, 1887.

Laramie group?: Carbon, Wyoming.

Acer indivisum Lx.=Acer Lesquereuxii.

Acer Lesquereuxii nom. nov.

Acer indivisum * Lx. Cret. and Tert. Fl., p. 180, pl. xxxvi, f. 6, 9, 1883.

[* A. indivisum Lx., 1883. Preoccupied by O. Weber, 1852.]

Green River group: Uinta County, formerly but wrongly called Randolph County, Wyoming.

Acer macropterum Heer. Kongl. Vetenskaps-Akad. Föhandl., 1868, p. 68; K. Sv. Vetenskaps-Akad. Handling, vol. viii, no. 4, p. 37, pl. ix, f. 7-9, 1869. [In Fl. Foss. Arct., II, abt. 2, 1871.]

Eocene?: Port Graham, Alaska.

Acer minutus (m). Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 35, pl. iii, f. 6, 1892.

Cretaceous: Staten Island.

Acer obtusilobum? Ung. Lesquereux [1868]=Menispermites salinæ.

Acer paucidentatum Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 132, pl. xiv, f. 2, 3, 1897.

Clay marl [Upper Cretaceous]: Cliffwood, New Jersey.

Acer pleistocenicum Penhallow. Bull. Geol. Soc. Am., vol. i, p. 327, f. (in text) 1, 1890.

Pleistocene: Don River, Toronto, Canada.

Acer saccharinum Wang. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 329, 1890.

Acer spicatum Lam. Dn., Can. Nat., vol. iii, new ser., p. 71, 1868; Geol. Hist. Pl., p. 228, 1888. [Not *Acer spicatum* Lam.]

Pleistocene: Greens Creek, Ottawa River, Canada.

Acer saskatchewense Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 16, 1885 [1886].

Belly River series: Medicine Hat, Northwest Territory.

Acer secreta Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 12, 1871 [1872.] [Not afterwards mentioned by author.]
Laramie?: Evanston, Wyoming.

Acer spicatum Lam. Dn., Can. Nat., vol. iii, new ser., p. 71, 1868 = A. saccharinum Wang.

Acer trilobatum? (Sternb.) Al. Br. Neues Jahrb. f. Min. 1845, p. 172, 1845; Lesquereux, Am. Journ. Sci., vol. xxvii, p. 361, 1859; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 293, 1871 [1872].
Phyllites trilobatus Strenbg. Fl. d., Vorwelt, Index Iconum, pl. 1, f. 2, 1825.
———?: Bellingham Bay.
Laramie group: Evanston, Wyoming.

Acer trilobatum productum? (Al. Br.) Heer. Fl. Tert. Helv., vol. iii, p. 50, pl. cxiv, f. 1, 4–8, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 388, 1872 [1873]; Tert. Fl., p. 261, pl. xlviii, f. 2, 3*a*, 1878.
Acer trilobatum Al. Br. Lx., Ann. Rept., op. cit., p. 408, 1873 [1874].
Denver group?: Sedalia, Colorado.
Laramie group?: Carbon, Wyoming.

Acer trilobatum productum Al. Br. Lx. Cret. and Tert. Fl., p. 258 = Acer Bendirei.

Acer trilobatum tricuspidatum (Al. Br.) Heer. Fl. Tert. Helv., vol. iii, p. 49, pl. cxiii, f. 3–10, 1859; Ward, Bull. U. S. Geol. Surv., no. 37, p. 66, pl. xxix, f. 3, 4, 1887.
Acer tricuspidatum Al. Br. Neues Jahrb. f. Min., p. 172, 1845.
Fort Union group: Clear Creek and Little Missouri, Montana.

Acer vitifolium Al. Br. Neues Jahrb. f. Min., 1845, p. 172, 1845; Lesquereux, Proc. U. S. Nat. Mus., vol. x, p. 44, 1887.
Pleistocene?: Wytheville, Virginia.

Acer, branches of, Lx. Proc. U. S. Nat. Mus., vol. xi, p. 15, 1888.
Miocene: John Day Valley, Oregon.

Acer, fruits of, Lx. Proc. U. S. Nat. Mus., vol. xi, p. 15, pl. vi, f. 2, 3; pl. vii, f. 2, 1888.
Miocene: John Day Valley, Oregon.

Acer, fruit of, Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 87, f. (in text) 20, 1890.
Eocene?: Stump Lake, British Columbia.

Acer sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 286, 1871 [1872]. [Not afterwards mentioned by Lesquereux.]
Eocene?: Barrell Springs, Wyoming.

Acer sp., Lx. Cret. and Tert. Fl., p. 181, pl. xxxvi, f. 7, 8, 1883.
Green River group: Florissant, Colorado.

Acer sp., Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 61 (app.), 1878.
Miocene: Oregon Creek, 20 miles north of Chalk Bluffs, California.

ACERIPHYLLUM Fontaine. Potomac Fl., p. 320, 1889.

Aceriphyllum aralioides Font. Potomac Fl., p. 321, pl. clxiii, f. 8, 1889.
Potomac formation: Virginia.

ACERATES Nilsson. Act. Ac. Holm., p. 345, 1831.

Acerates sp., Hollick in Newby., Fl. Amboy Clays, p. 124, pl. xxxii, f. 17; xli, f. 4, 5, 1895 [1896].
Amboy clay: South Amboy, New Jersey.

ACERITES Viviani. Mem. Soc. Geol. d. France, vol. i, p. 131, 1833.

Acerites menispermifolia Lx.=Menispermites menispermifolia.

Acerites multiformis Lx. Fl. Dak. Gr., p. 156, pl. xxxiv, f. 1–9, 1892.
Dakota group: Kansas.

Acerites negundifolium Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 86, f. (in text) 19, 1890.
Eocene?: Stump Lake, British Columbia.

Acerites pristinus Newby. Later Extinct Flora, p. 15, 1868; Ill. Cret. and Tert. Pl., pl. v, f. 4, 1878.
Dakota group: Blackbird Hill, Nebraska.

ACORUS Linneaus. Gen. ed., i, p. 104, 1737.

Acorus affinis Lx. Ann. Rep. U. S. Geol. and Geogr. Surv. Terr., p. 410, 1873 [1874]. [Not afterwards recognized.]
Green River group?: Florissant, Colorado.

Acorus brachystachys Heer. K. Sven. Vetenskaps-Akad. Handl., vol. viii, no. 7, p. 51, pl. viii, f. 7, 8, 1870 [in Fl. Foss. Arct. ii, abt. iii, 1871]; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 288, 1871 [1872]; Tert. Fl., p. 105, pl. xiv, f. 12–15, 1878.
Denver group?: Sedalia, Colorado.
Laramie group?: Carbon, Wyoming.

Acorus calamus L. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 365, 1859.
Pleistocene: Banks of Mississippi River near Columbus, Kentucky.

ACROSTICHOPTERIS Fontaine. Potomac Fl., p. 106, 1889.

Acrostichopteris cyclopteroides Font. Potomac Fl., p. 109, pl. xciv, f. 8, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Acrostichopteris densifolia Font. Potomac Fl., p. 107, pl. xciv, f. 4; clxx, f. 11; clxxi, f. 2, 6; clxxii, f. 13, 1889.
Potomac formation: Baltimore, Maryland; Dutch Gap Canal, Virginia.

Acrostichopteris longipennis Font. Potomac Fl., p. 107, pl. clxx, f. 10; clxxi, f. 1, 5, 7, 1889.
Potomac formation: Baltimore, Maryland.

Acrostichopteris parcelobata Font. Potomac Fl., p. 108, pl. xciv, f. 6, 7, 11, 14, 1889.
Potomac formation: Dutch Gap Canal, and near Potomac Run, Virginia.

Acrostichopteris parvifolia Font. Potomac Fl., p. 108, pl. xciv, f. 5, 9, 10, 12; clxxi, f. 3, 4; clxxii, f. 14, 1889.
Potomac formation: Baltimore, Maryland; Dutch Gap Canal, Trents Reach, Virginia.

ACROSTICHUM Linnæus. Gen. Pl., p. 322, 1737.

Acrostichum crassifolium Font. Potomac Fl., p. 105, pl. xvi, f. 7, 1889.
Potomac formation: Fredericksburg, Virginia.

Acrostichum hesperium Newby. Proc. U. S. Nat. Mus., vol. v, p. 503, 1882 [1883].
Eocene: Green River, Wyoming.

ADIANTITES Göppert. Syst. Filic. Foss., p. 216, 1836.

Adiantites gracillimus Lx. Cret. and Tert. Fl., p. 137, pl. xxi, f. 8, 1883.
Green River group: Florissant, Colorado.

Adiantites Klipsteini (Dunk.) Brongn. = Glossozamites Klipsteini.

Adiantites prælongus Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 25, pl. v, f. 19, 1882 [1883].
Upper Cretaceous: Baynes Sound, Vancouver Island, Nanaimo.

ÆSCULOPHYLLUM Dawson. Trans. Roy. Soc. Canada, 2d ser., vol. i, sec. iv, p. 149, 1895–96.

Æsculophyllum hastingense Dn. Trans. Roy. Soc. Canada, 2d ser., vol. i, sec. iv, p. 149, pl. viii, f. 16, 1895–96.
Eocene: Burrard Inlet, British Columbia.

ÆSCULUS Linnæus. Syst., ed. ii, p. 22, 1740.

Æsculus antiquus Dn. Rept. on Geol. and Res. near Forty-ninth Parallel, appen. A, p. 330, pl. xvi, f. 8, 9, 1875.
Bad Lands: West of Woody Mountain, Canada.

Aleurites eoceneca Lx. = Grewiopsis eocenica.

ALIANTHOPHYLLUM Dawson. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 88, 1890 [1891].

Alianthophyllum incertum Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 88, f. (in text) 25, 1890 [1891].
Eocene?: Tranquille River, British Columbia.

ALIANTHUS Desfontaines. Act. Ac. Paris, p. 265, 1786.

Alianthus longe-petiolata Lx. Cret. and Tert. Fl., p. 197, pl. xl, f. 6, 7, 1883.
Green River group: Uinta County, formerly but wrongly called Randolph County, Wyoming.

Alianthus ovata Lx. Cret. and Tert. Fl., p. 254, pl. li, f. 7, 8, 1883.
Miocene: Bridge Creek, Oregon.

ALICMACITES Saporta. Ann. sci. nat. Bot., 4th ser., vol. xvii, p. 228, 1862.

Alismacites dakotensis Lx. Fl. Dak. Gr., p. 37, pl. ii, f. 10, 1892.
Dakota group: Kansas.

ALNITES Göppert. De Floribus in Statu Fossili: Nova Acta Acad. Cæs. Leop., vol. xviii, pt. 3, p. 564, p. 20 of reprint, 1837.

Alnites curta Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 86, f. (in text) 18–18*c*, 1890 [1891].
  Eocene?: North Fork Similkameen River, British Columbia.

Alnites crassus Lx. Geol. and Nat. Hist. Survey Minn., vol. iii, p. 13, pl. B, f. 4, 1893.
  Dakota group: New Ulm, Minnesota.

Alnites grandifolia Newby. Later Extinct Floras, p. 9, 1868; Ills. Cret. and Tert. Pl., pl. iv, f. 2, 1878.
  Dakota group: Nebraska.

Alnites inæquilateralis Lx. = Alnus inæquilateralis.

Alnites insignis Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 28, pl. viii, f. 38, 1882 [1883].
  Upper Cretaceous: Nanaimo.
  Mill Creek series: Mill Creek ?.

Alnites quadrangularis Lx. = Hamamelites quadrangularis.

ALNUS Gærtner. Fr. and Sem., vol. ii, p. 54, pl. 90, 1791.

Alnus alaskana Newby. Proc. U. S. Nat. Mus., vol. v, p. 509, 1882 [1883].
  Eocene?: Kootznahoo Archipelago, Alaska.

Alnus carpinifolia Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 45, 1888.
  Denver group: Golden, Colorado.

Alnus carpinioides Lx. Cret. and Tert. Fl., p. 243, pl. l, f. 11, pl. li, f. 4, 4*a*, 5, 1883.
  Miocene: Bridge Creek, Oregon.

Alnus cordata Lx. Cret. and Tert. Fl., p. 151, 1883.
  Green River group: Florissant, Colorado.

Alnus corrallina Lx. Cret. and Tert. Fl., p. 243, pl. li, f. 1–3, 1883.
  Miocene: Corrall Hollow, California; John Day Valley, Oregon.

Alnus corylifolia Lx. Proc. U. S. Nat. Mus., vol. v., p. 446, pl. vii, f. 1–4, 1882 [1883].
  Eocene?: Cook Inlet, Alaska.

Alnus grandiflora Newby. Proc. U. S. Nat. Mus., vol. v, p. 509, 1882 [1883].
  Eocene?: Cook Inlet, Alaska.

Alnus Grewiopsis Ward. Bull. U. S. Geol. Surv., no. 37, p. 30, pl. xiv, f. 1, 1887.
  Laramie group: Hodges Pass, Wyoming.

Alnus inæquilateralis Lx. Cret. and Tert. Fl., p. 151, 1883.
  Alnites inæquilateralis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 381, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 307, 1874 [1876]; Tert. Fl., p. 141, pl. lxii, f. 1–4, 1878.
  Green River group: Alkali Station, Wyoming.

Alnus kanseana Lx. = Hamamelites kansaseanus = Quercus kanseana.

Alnus Kefersteinii (Göpp.) Ung. Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 292, 1871 [1872]; Tert. Fl., p. 140, pl. xviii, f. 6–8; lxiv, f. 11, 1878; Heer., Fl. Foss. Alask., p. 28, pl. iii, f. 7, 8, 1869.

Alnites Kefersteinii Göpp. De Floribus in Statu Fossili, p. 564, pl. xli, f. 1–7, 1837.

Eocene?: Alaska.

Miocene: John Day Valley, Oregon; Shasta County, California.

Alnus Kefersteinii (Göpp.) var. Heer. Fl. Foss. Alask.: K. Sv. Vetenskaps-Akad. Handl., vol. viii, No. 4, p. 28, pl. v, f. 9, 1869. [In Fl. Foss. Arct., ii, abt. ii, 1871.]

Eocene?: Port Graham, Alaska.

Alnus rubra Bong. Knowlton. Journ. Geol., vol. iii, p. 532, 1895.

Inter-glacial: Muir Glacier, Alaska.

Alnus rugosa Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 45, 1888.

Denver group: Golden, Colorado.

Alnus serrata Newby. Later Extinct Floras, p. 55, 1868.

Fort Union group: Yellowstone River, Montana and Dakota.

Alnus sp., Penhallow. Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 70, 1896.

Pleistocene: Scarboro Heights, Ontario.

AMELANCHIER Medicus. Phil. Bot., i, p. 155, 1789.

Amelanchier canadensis (L.) Medic., var. **rotundifolia** (Mx.) T. & G. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.

Miocene?: Bridgeton, New Jersey.

Amelanchier typica Lx. Cret. and Tert. Fl., p. 198, pl. xl., f. 11, 1883.

Green River group: Florissant, Colorado.

Amelanchier typica var. Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 57, 1888.

Denver group: Golden, Colorado.

Amelanchier similis Newby. Later Extinct Floras, p. 48, 1868; Ill. Cret. and Tert. Pl., pl. xxv., f. 6, 1878.

Fort Union group: Yellowstone River, Montana.

Ament of Conifer (a) Font. Potomac Fl., p. 225, pl. cxxxvi, f. 2, 1889.

Potomac formation: Near Brooke, Virginia.

Ament of Conifer (b) Font. Potomac Fl., p. 225, pl. cxxxvi, f. 3, 1889.

Potomac formation: Near Brooke, Virginia.

Ament of Conifer (c) Font. Potomac Fl., p. 226, pl. cxxxvi, f. 4, 1889.

Potomac formation: Near Brooke, Virginia.

Ament of Conifer (d) Font. Potomac Fl., p. 226, pl. cxxxvi, f. 5, 1889.

Potomac formation: Near Cherry Hill Station, Virginia.

Ament of Conifer (e) Font. Potomac Fl., p. 226, pl. cxxxv, f. 7, 1889.

Potomac formation: Near Brooke, Virginia.

Ament of Conifer (f) Font. Potomac Fl., p. 227, pl. cxxxvi, f. 8, 1889.

Potomac formation: Near Brooke, Virginia.

Ament of Angiosperm? Font. Potomac Fl., p. 272, pl. cxxxv, f. 16, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

AMPELOPHYLLUM Lesquereux. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 395, 1875 [1876].

Ampelophyllum attenuatum Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 396, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 354, pl. ii, f. 3, 1874 [1876].

Dakota group: Fort Harker, Kansas.

Ampelophyllum firmum Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 396, 1875 [1876].

Dakota group: Kansas.

Ampelophyllum ovatum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 355, 1874 [1876].

Celtis? ovata Lx. Cret. Fl., p. 66, pl. iv, f. 2, 3, 1874.
Populites ovata Lx. Am. Journ. Sci., vol. xlvi, p. 94, 1868.

Dakota group: Decatur, Nebraska.

AMPELOPSIS Michaux. Fl. Bor. Am., vol. i, p. 159, 1803.

Ampelopsis tertiaria Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 7, 1871 [1872]; Tert. Fl., p. 242, pl. xliii, f. 1, 1878.

Green River group: Green River Station, Wyoming.

AMYGDALUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Amygdalus gracilis Lx. Cret. and Tert. Fl., p. 199, pl. xl, f. 12–15; pl. xliv, f. 6, 1883.

Green River group: Florissant, Colorado; Uinta County, formerly but wrongly called Randolph County, Wyoming.

ANDROMEDA Linnæus. Syst., ed. i, 1735.

Andromeda acuminata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 393, 1875 [1876].

Dakota group: Kansas.

Andromeda affinis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 348, 1874 [1876]; Cret. and Tert. Fl., p. 60, pl. ii, f. 5, 1883.

Livingston beds: Bozeman coal field.
Laramie group: Bozeman coal field.
———: Las Animas, Colorado.

Andromeda crassa Lx. Proc. U. S. Nat. Mus., vol. xi, p. 16, 1888.

Miocene: John Day Valley, Oregon.

Andromeda cretacea Lx. Fl. Dak. Gr., p. 117, pl. xvii, f. 17, 18; pl. xxiv, f. 5, 1892.

Dakota group: Kansas.

Andromeda delicatula Lx. Cret. and Tert. Fl., p. 175, pl. xxxiv, f. 10, 11, 1883.

Green River group: Uinta County formerly, but wrongly called Randolph County, Wyoming.

Andromeda dubia Lx. Am. Journ. Sci., vol. xxvii, p. 364, 1859; Geol. Tenn., p. 428, pl. K, f. 5, 1869.

Pleistocene?: Somerville, Fayette County, Tennessee.

Andromeda flexuosa Newby. Fl. Amboy Clays, p. 121, pl. xxxiv, f. 1–5, 1895 [1896].
Amboy clay: Woodbridge, Sayreville, New Jersey.

Andromeda Grayana Heer. Neue Denkschr., vol. xxi, p. 7, pl. i, f. 7–9, 1865; Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 271, 1871 [1872]; Tert. Fl., p. 234, pl. xl, f. 4, 1878.
Eocene?: Port Graham, Alaska; ? Bozeman coal field, Montana; Burrard Inlet, British Columbia.

Andromeda latifolia Newby. Fl. Amboy Clays, p. 120, pl. xxxiii, f. 6–10; xxxiv, f. 6–11; xxxvi, f. 10, 1895 [1896].
Amboy clay: Woodbridge, Sayreville, New Jersey.

Andromeda linearifolia Lx. Proc. U. S. Nat. Mus., vol. x, p. 42, pl. iii, f. 2, 3, 1887.
Denver beds: Silver Cliff, Colorado.

Andromeda linifolia Lx. Fl. Dak. Gr., p. 118, pl. lii, f. 5, 1892.
Dakota group: Kansas.

Andromeda novæ-cæsareæ Hollick in Newby. Fl. Amboy Clays, p. 121, pl. xlii, f. 9–12, 28–31, 1895 [1896].
Amboy clay: New Jersey.

Andromeda Parlatorii Heer. Phyll. Crét. d. Nebr., p. 18, pl. i, f. 5, 1866; Lx., Cret. Fl., p. 88, pl. xxiii, f. 6, 7; pl. xxviii, f. 15; Fl. Dak. Gr., p. 115, pl. xix, f. 1, pl. lii, f. 6, 1892.
Prunus? Parlatorii Lx. Am. Journ. Sci., vol. xlvi, p. 102, 1868.
Dakota group: Kansas, Nebraska, and New Ulm, Minnesota.
Cretaceous: Sea Cliff, Long Island.
Amboy clay: New Jersey.

Andromeda Parlatorii longifolia Lx. Fl. Dak. Gr., p. 116, pl. lxiv, f. 19, 1892.
Dakota group: Kansas.

Andromeda Pfaffiana Heer. Fl. Foss. Arct., vol. vi, abt. 2, p. 79, pl. xxv, f. 6; pl. xxxviii, f. 5–7; pl. xliv, f. 12, 1882; Lx., Fl. Dak. Gr., p. 116, pl. xviii, f. 7, 8; pl. lii, f. 7, 1892.
Dakota group: Kansas.

Andromeda protogæa Ung. Denkschr. Wien. Akad., vol. ii, p. 173 [43], pl. xliv, [xxiii], f. 1–9, 1850; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 20, 1888.
Eocene?: Cherry Creek, Oregon.

Andromeda reticulata? Ett. Tert. Fl. Häring: Abhandl. k. k. geol. Reichsan., vol. ii, abt. iii, p. 65, pl. xxii, f. 9, 10, 1853; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 296, 1871 [1872]. [Not afterwards recognized by Lesquereux.]
Laramie?: 6 miles above Spring Canyon, Montana.

Andromeda rhomboidalis Lx. Cret. and Tert. Fl., p. 176, 1883.
Green River group: Florissant, Colorado.

Andromeda Snowii Lx. Fl. Dak. Gr., p. 117, pl. xvii, f. 16, 1892.
Dakota group: Kansas.

Andromeda tenuinervis Lx. Fl. Dak. Gr., p. 116, pl. xxxviii, f. 7, 1892.
Dakota group: Kansas.

Andromeda vacciniifoliæ affinis Lx. Am. Journ. Sci., vol. xxvii, p. 364, 1859; Geol. Tenn., p. 428, pl. K. f. 4*a*, 4*b*, 1869.
Pleistocene?: Somerville, Fayette County, Tennessee.

Andromeda Wardiana Lx. Fl. Dak. Gr., p. 119, pl. lxiv, f. 17, 1892.
Dakota group: Kansas.

Andromeda sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 9, 1871 [1872]. [Not afterwards mentioned.]
Montana group?: Point of Rocks, Wyoming.

Andromeda sp., Lx. Report on Clays in N. J., p. 28, 1878.
Amboy clay: Washington, New Jersey.

Andromeda sp., Lx. Rept. on Clays in N. J., p. 29, 1878.
Amboy clay: South Amboy, New Jersey.

ANEMIA Swartz. Syn. Fil., p. 155, 1806.

Anemia stricta Newby. Fl. Amboy Clays, p. 38, pl. iii, f. 1, 2, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Anemia subcretacea (Sap.) Gard. and Ett. Monog. Brit. Eoc. Fl., vol. i, pt. ii, p. 45, pl. viii; pl. ix, 1880.
Asplenium subcretaceum Sap. Fl. Foss. Sézanne, Mem. Soc. Géol. France, 3d ser., vol. viii, p. 315, pl. xxiii, f. 4, 1868.
Gymnogramma Haydenii Lx. Ann. Rept. U. S. Geol. and Geog. Surv. Terr., p. 295, 1871 [1872]; Tert. Fl., p. 59, pl. iv, f. 1–3, 1878.
? Lathræa arguta Lx. Am. Journ. Sci., vol. xlv, p. 207, 1868.

Anemia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 145, 1897.
Fort Union: Black Buttes, Wyoming.

Anemia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 134, 1897.
Fort Union: Lightning Creek, Converse County, Wyoming.

ANGIOPTERIDIUM Schimper. Pal. Vég., vol. i, p. 602, 1869.

Angiopteridium auriculatum Font. Potomac Fl., p. 113, pl. vii, f. 8–11; xxviii, f. 1, 1889.
Potomac formation: Fredericksburg, Potomac Run, Virginia.

Angiopteridium canmorense Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv., p. 83, f. (in text) 2, 1892.
Kootanie: Canmore, British Columbia.
Knoxville beds: Tehama County, California.
Horsetown beds: Tehama County, California.

Angiopteridium densinerve Font. Potomac Fl., p. 115, pl. xxix, f. 4, 1889.
Potomac formation: Fredericksburg, Virginia.

Angiopteridium dentatum Font. Potomac Fl., p. 117, pl. xxx, f. 7–8, 1889.
Potomac formation: Fredericksburg, Virginia.

Angiopteridium ellipticum Font. Potomac Fl., p. 114, pl. xxix, f. 3, 1889.
Potomac formation: Fredericksburg, Virginia.

Angiopteridium nervosum Font. Potomac Fl., p. 114, pl. xxix, f. 2, 1889.
Potomac formation: Fredericksburg, Virginia.
Knoxville beds: Tehama County, California.

Angiopteridium oregonense Font. In Stanton, Bull. U. S. Geol. Surv., no. 133, p. 22, 1895 [1896]. Nomen nudum.
Horsetown beds: Riddles, Oregon.

Angiopteridium ovatum Font. Potomac Fl., p. 115, pl. xxix, f. 6, 7, 1889.
Potomac formation: Fredericksburg, Virginia.

Angiopteridium pachyphyllum Font. Potomac Fl., p. 115, pl. xxix, f. 5, 1889.
Potomac formation: Fredericksburg, Virginia.

Angiopteridium strictinerve Font. Potomac Fl., p. 116, pl. xxix, f. 8, 9, 1889.
Potomac formation: Fredericksburg, Virginia.

Angiopteridium strictinerve latifolium Font. Potomac Fl., p. 116, pl. xxx, f. 1, 5, 1889.
Potomac formation: Fredericksburg, Virginia.
Knoxville beds: Tehama County, California.

ANISOPHYLLUM Lesquereux. Cret. Fl., p. 98, 1874.

Anisophyllum semialatum Lx. Cret. Fl., p. 98, pl. vi, f. 1–5, 1874.
Quercus semialatus Lx. Am. Journ. Sci., vol. xlvi, p. 96, 1868.
Dakota group: Beatrice, Nebraska.

Anisophyllum sp. Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 28, pl. viii, f. 34, 1882 [1883].
Upper Cretaceous: Baynes Sound.

ANOMALOPHYLLITES Watlet. Descr. Pl. Foss. d. Bassin d. Paris, p. 99, 1866.

Anomalophyllites bridgetonensis Hollick. Bull. Torr. Bot. Club, vol. xxiv, p. 329, pls. 311–313, 1897.
Miocene?: Bridgeton, New Jersey.

ANOMOZAMITES Schimper. Pal. Vég., vol. ii, p. 140, 1870.

Anomozamites acutiloba? Heer. Fl. Foss. Arct., vol. iv, abt. 2, p. 102, pl. xxiii, f. 1*a*; xxiv, f. 1–3; xxv, f. 9; xxvii, f. 3*b*, 1876; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 7, pl. i, f. 7, 1885 [1886].
Kootanie: Near Canmore, British Columbia.

Anomozamites angustifolius Font. Potomac Fl., p. 167, pl. xxx, f. 2, 3, 1889.
Potomac formation: Fredericksburg, Virginia; Baltimore, Maryland.

Anomozamites virginicus Font. Potomac Fl., p. 168, pl. xxx, f. 4; xxxi, f. 3, 1889.
Potomac formation: Near Potomac Run and near Telegraph Station, Virginia.

Anomozamites sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 91, 1892 [1893].
Kootanie: Martin Brook, British Columbia.

ANONA Linnæus. Syst., ed. i, 1735.

Anona cretacea Lx. Cret. and Tert. Fl., p. 77, 1883.
Dakota group: Glasco, Kansas.

Anona robusta Lx. Cret. and Tert. Fl., p. 124, pl. xx, f. 4, 1883.
Laramie group?: Golden, Colorado.

ANTHOLITHES Brongniart. Mém. d. Mus. d'Hist. Nat., vol. viii, p. 238, 1822.

Antholithes amissus Heer. Fl. Foss. Arct., vol. i, p. 139, pl. xxiii, f. 12, 1868.
Miocene?: Mackenzie River.

Antholithes amœnus Lx. Cret. and Tert. Fl., p. 203, pl. xxxiv, f. 13–15, 1883.
Green River group: Florissant, Colorado.

Antholithes horridus Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 7, 1885 [1886].
Carpolithes horridus Dn. Trans. op. cit., vol. i, sec. iv, p. 21, pl. i, f. 3, 3*a*, 3*b*, 1882 [1883].
Upper Cretaceous: Pine River, Northwest Territory.
Kootanie: North Fork Old Man River, British Columbia.

Antholithes improbus Lx. Cret. and Tert. Fl., p. 204, pl. xl, f. 20, 21, 1883.
Green River group: Uinta, formerly erroneously called Randolph County, Wyoming.

Antholithes obtusilobus Lx. Cret. and Tert. Fl., p. 203, pl. xxxii, f. 20, 1883.
Green River group: Florissant, Colorado.

Antholithes sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 82, f. (in text) 11, 1890.
Miocene?: Similkameen Valley, British Columbia.

Antholithus Gaudium-Rosæ Ward. Fifteenth Ann. Rept., U. S. Geol. Surv., p. 355, pl. iii, f. 7, 1895.
Potomac formation: Mount Vernon, Virginia.

APEIBOPSIS Heer. Fl. Tert. Helv., iii, p. 37, 1859.

Apeibopsis cyclophylla Lx. Fl. Dak. Gr., p. 180, pl. xxv, f. 6, 1892.
Dakota group: Kansas.

Apeibopsis? discolor Lx. Tert. Fl., p. 259, pl. xlvi, f. 4–7, 1878.
Rhamnus discolor Lx., p. p. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 398, 1872 [1873]. [See *R. discolor*.]
Laramie group: Black Buttes, Wyoming.

Apeibopsis Gaudini Lx. Am. Journ. Sci., vol. xxxii, p. 358, 1861; Geol. Vt., vol. ii, p. 715, 139, 140, 1861.
Brandon, Vermont.

Apeibopsis Heerii Lx. Am. Journ. Sci., vol. xxxii, p. 358, 1861; Geol. Vt., vol. ii, p. 715, f. 131, 132, 133, 1861.
Brandon, Vermont.

APOCYNOPHYLLUM Unger. Gen. et. Sp. Pl. Foss., p. 433, 1850.

Apocynophyllum Scudderi Lx. Cret. and Tert. Fl., p. 172, pl. xlvA, f. 1-5, 1883.
Green River group: Alkali Station, Wyoming.

Apocynophyllum sordidum Lx. Fl. Dak. Gr., p. 109, pl. lxiv, f. 11, 1892.
Dakota group: Kansas.

ARALIA (Tournefort) Linnæus. Syst., ed. i, 1735.

Aralia acerifolia Lx. Cret. and Tert. Fl., p. 232, pl. xlix, f. 5, 1883; op. cit., p. 265, pl. xlvB, f. 1.
Fort Union group: Bad Lands, Dakota.
Miocene: Chalk Bluffs, California.

Aralia angustiloba Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 22, pl. v, f. 4, 5, 1878.
Miocene: Chalk Bluffs, California.

Aralia berberidifolia Lx. Fl. Dak. Gr., p. 135, pl. xvi. f. 11, 1892.
Dakota group: Kansas.

Aralia concinna Newby.=Aralia Wellingtoniana.

Aralia coriacea Vel. Fl. Böhm. Kreideform., Theil iii, p. 11, pl. i [xvi], f. 1-9; ii [xvii], f. 2, 1884; Hollick, Bull. Geol. Soc. Am., vol. 7, p. 13, 1895.
Cretaceous: Marthas Vineyard.

Aralia concreta Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 394 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 349, pl. iv, f. 2-4, 1874 [1876].
Aralia semiorbiculata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 394, 1875.
Dakota group: Kansas.

Aralia digitata Ward. Bull. U. S. Geol. Surv., no. 37, p. 62, pl. xxvii, f. 3, 5; pl. xxviii, f. 1, 1887; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 20, pl. xi, f. 4, 1888.
Fort Union group: Clear Creek, Montana.
Eocene?: Cherry Creek, Oregon.

Aralia dissecta Lx. Cret. and Tert. Fl., p. 176, pl. xxxv, 1883.
Green River group: Florissant, Colorado.

Aralia dubia Font.=Aralia Fontainei.

Aralia Fontainei nom. nov.
Aralia dubia * Font. Potomac Fl., p. 314, pl. clvii, f. 1, 7, 1889.
[*Aralia dubia Font., 1889. Preoccupied by *A. dubia* (Ett.) Sch., Pal. Vég., iii, 35, 1874.]
Potomac formation: Deep Bottom, Virginia.

Aralia formosa Heer. Kreide-Flora v. Moletein, p. 18, pl. viii, f. 3, 1869; cf. Lx., Cret. and Tert. Fl., p. 60, pl. xi, f. 3, 4, 1883; Fl. Dak. Gr., p. 131, 1892; Newby., Fl. Amboy Clays, p. 116, pl. xxii, f. 8, 1895 [1896].
Dakota group: Morrison, Colorado.
Amboy clay: South Amboy, New Jersey.

Aralia ? gracilis Lx. Tert. Fl., p. 236, pl. xxxix, f. 1, 1878.
Liquidambar gracilis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 287, 1871 [1872].
Laramie?: Bridgers Pass, Wyoming.

Aralia grœnlandica Herr. Fl. Foss. Arct., vol. vi, abt. 2, p. 84, pl. xxxviii, f, 3; xxxix, f. 1; xlvi f. 16, 17, 1882; Lx., Fl. Dak. Gr., p. 134, pl. liv, f. 1–3, 1892; Newby., Fl. Amboy Clays, p. 116, pl. xxviii, f. 4, 1895 [1896].
Dakota group: Kansas.
Amboy clay: Woodbridge, New Jersey.
Cretaceous: Marthas Vineyard.

Aralia lasseniana Lx. Proc. U. S. Nat. Mus., vol. xi, p. 28, pl. xiv, f. 5, 1888.
Miocene?: Lassen County, California.
Eocene?: Lassen County, California.

Aralia Looziana Sap. and Mar. Mém. Cour. Acad. Roy. de Belgique, vol. xli, p. 77, pl. xiii, f. 1–3, 1878; Ward, Bull. U. S. Geol. Surv., no. 37, p. 6, pl. xxvii, f. 2, 1887.
Fort Union group: Clear Creek, Montana.

Aralia macrophylla Newby. Proc. U. S. Nat. Mus., vol. v, p. 513, 1882 [1883].
Eocene: Green River, Wyoming.

Aralia Masoni Lx. Fl. Dak. Gr., p. 133, pl. xv, f. 4, 1892.
Dakota group: Kansas.

Aralia nassauensis Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 55, pl. 174, f. 3, 7, 1894.
Cretaceous: Brooklyn, New York.

Aralia notata Lx. Tert. Fl., p. 237, pl. xxxix, f. 2–4, 1878; Ward, Bull. U. S. Geol. Surv., no. 37, p. 60, pl. xxvii, f. 1; Proc. U. S. Nat. Mus., vol. xi, p. 40, pl. xvii, f. 1, 1888.
Platanus dubia* Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 406, 1873 [1874].
[*Araila dubia. Preoccupied by *A. dubia* (Ett.) Sch., Pal. Vég. iii, 35, 1874.]
Denver beds: Mount Bross and Golden, Colorado.
Fort Union group: Elk Creek, Yellowstone National Park; Yellowstone River.
Eocene?: Cherry Creek, Oregon.

Aralia palmata Newby. Fl. Amboy Clays, p. 117, pl. xxxix, f. 6, 7; xl, f. 3, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Aralia patens Newby (MSS.). Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 54, pl. 174, f. 4, 1894; Newby., Fl. Amboy Clays, p. 117, pl. xxxviii, f. 6, 1895 [1896].
Cretaceous: Glen Cove, Long Island.
Amboy clay: Woodbridge, New Jersey.

Aralia polymorpha Newby. Fl. Amboy Clays, p. 118, pl. xxxix, f. 1-5, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Aralia pungens Lx. = Artocarpus Lessigiana.

Aralia quinquepartita Lx. Bull. U. S. Geol. Surv. Terr., vol. i, p. 394, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 302, 1871 [1872]; Newby., Fl. Amboy Clays, p. 115, pl. xl, f. 1, 2, 1895 [1896].
Dakota group: Fort Harker, Kansas.
Amboy clay: Woodbridge, New Jersey.

Aralia radiata Lx. Cret. and Tert. Fl., p. 64, pl. vii, f. 2, 3, 1883.
Dakota group: Kansas.

Aralia rotundata Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 14, pl. iv, f. 5, 1885 [1886].
Mill Creek series: Mill Creek.

Aralia rotundiloba Newby. Fl. Amboy Clays, p. 118, pl. xxviii, f. 5; xxxvi, f. 9, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Aralia Saportana Lx. Bull. U. S. Geol. Surv. Terr., vol. i, p. 394, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 350, pl. i, f. 2, *2a*, 1874 [1876]; Cret. and Tert. Fl., p. 61, pl. viii, f. 1, 2; pl. ix, f. 1, 2, 1883.
Dakota group: Kansas.

Aralia Saportana deformata Lx. Fl. Dak. Gr., p. 131, pl. xxiii, f. 1, 2, 1892.
Dakota group: Kansas.

Aralia semiorbiculata Lx. = Aralia concreta.

Aralia subemarginata Lx. Cret. and Tert. Fl., p. 63, 1883; Fl. Dak. Gr., p. 133, pl. xv, f. 3, 1892.
Dakota group: Kansas.

Aralia tenuinervis Lx. Cret. and Tert. Fl., p. 63, pl. vii, f. 4, 1883.
Dakota group: Kansas.

Aralia Towneri Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 394, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 349, pl. iv, f. 1, 1874 [1876]; Cret. and Tert. Fl., p. 62, pl. vi, f. 4, 1883; Fl. Dak. Gr., p. 132, pl. xxiii, f. 3, 4; pl. xxxi, f. 1, 1892.
Dakota group: Kansas.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey (?).

Aralia transversinervia Sap. and Mar. Rev. Fl. Heers. Gelind., p. 79, pl. 12, f. 4; pl. 14, f. 1, 1878; Hollick, Bull. Torr. Bot. Club., vol. xxi, p. 54, pl. 176, f. 1, 18"4.
Cretaceous: Oak Neck, Long Island.

Aralia triloba Newby. Later Extinct Floras, p. 58, 1868.
Fort Union group: Fort Clarke.

Aralia tripartita Lx.=Sterculia tripartita.

Aralia Wellingtoniana Lx. Fl. Dak. Gr., p. 131, pl. xxi, f. 1; pl. xxii, f. 2, 3, 1892; Newby, Fl. Amboy Clays, p. 114, pl. xxvi, f. 1, 1895 [1896].
Aralia concinna Newby. Fl. Amboy Clays, p. 114, 1895 [1896].
Dakota group: Kansas.
Amboy clay: Woodbridge, New Jersey.

Aralia Westoni Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 14, pl. iv, f. 6, 1885 [1886].
Mill Creek series: Mill Creek.

Aralia Whitneyi Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 20. pl. v, f. 1, 1878.
Miocene: Chalk Bluffs, California.
Miocene?: John Day Valley, Oregon.

Aralia Zaddachi? Heer. Mioc. Balt. Fl., p. 89, pl. xv, f. 1*b*, 1869; Lx., Mem. Mus. Comp. Zoöl., vol. vi, p. 21, pl. v, f. 2, 3, 1878; Cret. and Tert. Fl., p. 265, pl. xlv B, f. 8–9, 1883.
Miocene: Table Mountain, Tulomne County, California.

Aralia sp., Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 14, 1885 [1886].
Mill Creek series: North Fork Old Man River.

Aralia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 133, 1897.
Laramie: Lance Creek, Converse County, Wyoming.

Aralia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 133, 1897.
Laramie: Lance Creek, Converse County, Wyoming.

ARALIÆPHYLLUM Fontaine. Potomac Fl., p. 316, 1889.

Araliæphyllum aceroides Font. Potomac Fl., p. 319, pl. clvi, f. 11; clxii, f. 2, 1889.
Potomac formation: Near Brooke, Virginia.

Araliæphyllum acutilobum Font. Potomac Fl., p. 318, pl. clxiii, f. 2, 1889.
Potomac formation: Near Brooke, Virginia.

Araliæphyllum magnifolium Font. Potomac Fl., p. 318, pl. clix, f. 9, 10, 1889.
Potomac formation: Near Brooke, Virginia.

Araliæphyllum obtusilobum Font. Potomac Fl., p. 317, pl. clxiii, f. 1, 4; clxiv, f, 3, 1889.
Potomac formation: Near Brooke, Virginia.

Araliopsis sp., Lx. Rept. on Clay in N. J., p. 29, 1878 = ?
Amboy clay: Sayreville, New Jersey.

ARAUCARIA Jussieu. Gen. Pl., p, 413, 1789.

Araucaria obtusifolia Font. Potomac Fl., p. 249, pl. lxxxvi, f. 13, 1889.
Potomac formation: Trents Reach, Virginia.

Araucaria podocarpoides Font. Potomac Fl., p. 349, pl. lxxxvi, f. 4, 1889.
Potomac formation: Near Brooke, Virginia.

Araucaria spathulata Newby. Later Extinct Floras, p. 10, 1868; Ill. Cret. and Tert. Pl., pl. ii, f. 5, 5*a*, 1878.
Dakota group?: Sage Creek, Nebraska.

Araucaria zamioides Font. Potomac Fl., p. 250, pl. cxxi, f. 1, 1889.
Potomac formation: Near Potomac Run, Virginia.

ARAUCARIOXYLON Krause in Schimper. Pal. Vég., vol. ii, p. 380, 1872.

Araucarioxylon virginianum Kn. Bull. U. S. Geol. Surv., no. 56, p. 50, pl. vii, f. 2–5, 1888.
Triassic?: Taylorsville, Virginia.

Araucarioxylon sp., Kn. Journ. Geol, vol. ii, p. 260, 1894.
Lower Cretaceous: Black Hills, South Dakota.

ARAUCARITES Presl. in Sternberg Vers., ii, p. 203, 1833.

Araucarites aquiensis Font. Potomac Fl., p. 264, pl. cxxxiii, f. 8–12, 1889.
Potomac formation: Near Brooke, Virginia.

Araucarites ovatus Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 128, pl. xii, f. 3*a*, 4, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Araucarites virginicus Font. Potomac Fl., p. 263, pl. cxxxiv, f. 7, 1889.
Potomac formation: Trents Reach, Virginia.

ARISÆMA Martius. Flora, vol. xiv, p. 459, 1831.

Arisæma cretacea Lx. Fl. Dak. Gr., p. 38, pl. xlvi, f. 1, 1891.
Dakota group: Kansas.

Arisæma? dubia Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 130, pl. xii, f. 6, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Arisæma? mattewanense Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 130, pl. xii, f. 7, 1897.
Clay Marl (Upper Cretaceous): Cliffwood, New Jersey.

ARISTOLOCHIA (Tournefort) Linnæus. Syst., ed. i, 1735.

Aristolochia cordifolia Newby. Later Extinct Floras, p. 74, 1868.
Fort Union group: Yellowstone River, Montana.

Aristolochia curvata Lx. Am. Journ. Sci., vol. xxxii, p. 359, 1861; Geol. Vt., vol. ii, p. 715, f. 135, 136, 1861.
Brandon, Vermont.

Aristolochia dentata (Heer) Lx.=Aristolochites dentata.

Aristolochia obscura Lx. Am. Jour. Sci., vol. xxxii, p. 359, 1861; Geol. Vt., vol. ii, p. 715, f. 137, 138, 141, 1861.
Brandon, Vermont.

Aristolochia oeningensis Heer. Fl. Tert. Helv., vol. ii, p. 104, pl. c, f. 11*b*, 1856; Lx., Am. Journ. Sci., vol. xxxii, p. 359, 1861; Geol. Vt., vol. ii, p. 715, f. 134, 1861.
Brandon, Vermont.

ARISTOLOCHIÆPHYLLUM Fontaine. Potomac Fl., p. 322, 1889.

Aristolochiæphyllum crassinerve Font. Potomac Fl., p. 322, pl. clx, f. 3–6, 1889.
Potomac formation: Near Brooke, Virginia.

ARISTOLOCHITES Heer. Phyll. crét. d. Nebr.: Mém. Soc. helv. d. Sci. Nat., p. 18, 1866.

Aristolochites dentata Heer. Phyll. crét. d. Nebr., p. 18, pl. ii, f. 1, 2, 1866; Lx., Cret. Fl., p. 87, pl. xxx, f. 6, 1874.
Aristolochia dentata Heer. Lesquereux, Crét. and Tert. Fl., p. 59, 1883.
Dakota group: Nebraska.

Aristolochites infundibuliformis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 393, 1875 [1876]. [Apparently not afterwards referred to.]

ARTOCARPIDIUM Unger. Foss. Fl. v. Sotzka, p. 36: Denkschr. Wien Akad, vol. ii, p. 254, 1850.

Artocarpidium cretaceum Ett. Kreidefl. v. Niedersch., p. 251, pl. ii, f. 4, 1867; Lx., Fl. Dak. Gr., p. 86, pl. 1, f. 7, 1892.
Dakota group: Kansas.

Artocarpidium olmediæfolium? Heer. = Celastrinites artocarpidioides.

ARTOCARPOPHYLLUM Dawson. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 60, 1893 [1894].

Artocarpophyllum occidentale Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 60, pl. xii, f. 51; pl. xiii, f. 52, 1893 [1894].
Upper Cretaceous: Vancouver Island.

ARTOCARPUS Forster. Char. Gen., p. 101, 1776.

Artocarpus californica Kn. Science, vol. xxi, p. 24, 1893.
Auriferous gravels: Independence Hill, California.

Artocarpus Lessigiana (Lx.) Kn. Science, vol. xxi, p. 24, 1893.
Myrica? Lessigii Lx. Tert. Fl., p. 136, pl. lxiv, f. 1, 1878.
Myrica? Lessigiana Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i. p. 386, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 312, 1874 [1876].
Aralia pungens Lx. Cret. and Tert. Fl., p. 123, pl. xix, f. 3, 4, 1883.
Denver group: Golden, Colorado.
Laramie group: Coal Creek and Morrison, Colorado.
Miocene?: John Day Valley,? Oregon.

ARUNDO (Tournefort) Linnæus. Gen., ed. i, p. 19, 1737.

Arundo cretaceus Lx. = Phragmites cretaceus.

Arundo Göpperti? Münst. in Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 5, 1871 [1872]; Tert. Fl., p. 86, pl. viii, f. 3-5, 1878.
Green River group: Green River, Wyoming.
Denver group: Silver Cliff, Colorado.

Arundo? obtusa Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 385, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 311, 1874 [1876]; Tert. Fl., p. 87, pl. viii, f. 9, 9c, 1878.
Denver group: Golden, Colorado.

Arundo reperta Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 384, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 311, 1874 [1876].
Green River group: Green River, Wyoming.

ASIMINA Adanson. Fam. Pl., vol. ii, p. 365, 1763.

Asimina eocenica Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 387, 1872 [1873]; Tert. Fl., p. 251, pl. xliii, f. 5-8, 1878.
Denver group: Golden, Colorado.
Laramie group?: Carbon, Wyoming.

Asimina triloba (L.) Don. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 323, 1890; Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.
Pleistocene: Don River, Toronto.
Miocene?: Bridgeton, New Jersey.

ASPIDIOPHYLLUM Lesquereux. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 361, 1874 [1876].

Aspidiophyllum dentatum Lx. Cret. and Tert. Fl., p. 88, 1883; Fl. Dak. Gr., p. 212, pl. xxxix, f. 1, 1892.
Dakota group: Kansas.

Aspidiophyllum platanifolium Lx. Cret. and Tert. Fl., p. 88, pl. ii, f. 4, 1883.
Dakota group: Clay County, Kansas.

Aspidiophyllum trilobatum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 361, pl. ii., f. 1, 2, 1874 [1876]; Cret. and Tert. Fl., p. 87, pl. xii, f. 1; pl. xiii, f. 1-5; pl. xiv, f. 1, 1883.
Dakota group: Kansas.

Aspidium angustipinnatum Font.=Dryopteris angustipinnata.
Aspidium angustipinnatum montanense Font.=Dryopteris angustipinnata montanense.
Aspidium cystopteroides Font.=Dryopteris cystopteroides.
Aspidium dentatum Font.=Dryopteris dentata.
Aspidium Dunkeri (Schimp.) Font.=Cladophlebis Dunkeri.
Aspidium ellipticum Font.=Dryopteris elliptica.
Aspidium "Fisheri" Heer. Lesquereux (1870)=Lastrea intermedia.
Aspidium fredericksburgense Font.=Dryopteris fredericksburgense.
Aspidium goldianum Lx.=Lastrea goldiana.
Aspidium heterophylla Font.=Dryopteris heterophylla.

Aspidium Kennerleyi Newby=Dryopteris Kennerleyi.
Aspidium Lakesii (Lx.) Kn.=Dryopteris arguta.
Aspidium macrocarpum Font.=Dryopteris macrocarpa.
Aspidium microcarpum Font.=Dryopteris microcarpa.
Aspidium monocarpum Font.=Dryopteris monocarpa.
Aspidium montanense Font.=Dryopteris montanense.
Aspidium oblongifolium Font.=Dryopteris oblongifolia.
Aspidium Œrstedi Heer.=Dryopteris Œrstedi.
Aspidium parvifolium Font=Dryopteris parvifolia.
Aspidium pinnatifidum Font.=Dryopteris pinnatifida.
Aspidium pulchellum Heer. Lesquereux (1870)=Lastrea intermedia.
Aspidium virginicum Font.=Dryopteris virginica.

ASPLENIOPTERIS Fontaine. Potomac Fl., p. 117, 1889.

Aspleniopteris adiantifolia Font. Potomac Fl., p. 118, pl. xvi, f. 6, 1889.

Potomac formation: Fredericksburg, Virginia.

Aspleniopteris pinnatifida Font. Potomac Fl., p. 118, pl. xxii, f. 1–3, 6, 7, 1889.

Potomac formation: Fredericksburg, Virginia.

ASPLENITES Göppert. Syst. Fil. Foss.: Nova Acta Acad. Cæs. Leop. Nat. Cur., vol. xvii, p. 277, 1836.

Asplenites sp., Dn. Trans. Roy. Soc. Canada, 2d ser., vol. i, sec. iv, p. 142, pl. iv, f. 4, 1895–96.

Eocene: Stanley Park, Vancouver, British Columbia.

ASPLENIUM Linnæus. Gen. Pl., p. 322, 1737.

Asplenium (Diplazium) Crossii nom. nov.

Diplazium Mülleri? Heer. Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 393, 1873 [1874]; Tert. Fl., p. 55, pl. iv, f. 10, 10*a*, 1878. [Not *Diplazium Mülleri* Heer.]

Denver group: Golden, Colorado.

Asplenium albertum Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 11, pl. iii, f. 6, 1885 [1886].

Mill Creek series: Mill Creek.

Asplenium Dicksonianum Heer. Fl. Foss. Arct., vol. iii, pt. 2, p. 31, pl. i, f. 1–5, 1874; Lx., Fl. Dak. Gr., p. 24, pl. i, f. 1, 1*a*, 1891; Newby, Fl. Amboy Clays, p. 39, pl. i, f. 6, 7; ii, f. 1–8; iii, f. 3, 1896.

Amboy clay: Woodbridge, New Jersey.
Dakota group: Kansas.
Kootanie: Near Canmore; Coal Creek and North Fork Old Man River, British Columbia.

Asplenium (Diplazium) distans Heer. Mém. l'Acad. Imp. d. Sci. St. Pet., series vii, vol. xxii [Beiträge Jura-Fl. Ost-Sib. u. Amurl.], p. 97, pl. xix, f. 5–7, 1876; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 5, pl. iii, f. 7, 1885 [1886].

Kootanie: Near Canmore, British Columbia.

Asplenium dubium Font. Potomac Fl., p. 109, pl. x, f. 9.
Potomac formation: Fredericksburg, Virginia.

Asplenium erosum (Lx.) n. comb.
Pteris erosa Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 12, 1871 [1872]; Tert. Fl., p. 53, pl. iv, f. 8, 1878; Cret. and Tert. Fl., p. 121, pl. xix, f. 1, 1883.
Denver group: Golden, Colorado, etc.

Asplenium Fœrsteri Deb. and Ett.? Die urwelt. Acrobryen: (Denkschr. Wien. Akad., vol. xvii, p. 193), p. 13, pl. ii, f. 4–7, 11, 1859; Newby., Fl. Amboy Clays, p. 41, pl. iv, f. 1–11, 1895 [1896].
Amboy clay: Woodbridge, South Amboy, New Jersey.

Asplenium martinianum Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 5, pl. i, f. 1, 1885 [1886].
Kootanie: Martin Creek, Anthracite, and North Fork Old Man River, British Columbia.

Asplenium niobrara Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 20, pl. i, f. 1, 1882 [1883].
Peace River: Northwest Territory.

Asplenium subcretaceum Sap.=Anemia subcretacea.

Asplenium tenerum Lx. Cret. and Tert. Fl., p. 221, pl. xlviA, f. 1, 2, 1883.
Fort Union group: Bad Lands, Dakota.

Asplenium subsimplex (Lx.) n. comb.
Pteris subsimplex Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 392, 1873 [1874]; Tert. Fl., p. 52, pl. iv, f. 5-7, 1878.
Pteris anceps Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 376, 1872 [1873].
Pteris undulata Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 43, 1888.
Osmunda major Lx. Cret. and Tert. Fl., p. 121, pl. xviii, f. 5, 1883.
Denver group: Golden, Sedalia, Colorado.

Asplenium sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 140, 1897.
Laramie?: North Fork Dutton Creek, Wyoming.

Asplenium sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 133, 1897.
Laramie: Lance Creek, Converse County, Wyoming.

ATHROTAXOPSIS Fontaine. Potomac Fl., p. 239, 1889.

Athrotaxopsis expansa Font. Potomac Fl., p. 241, pl. cxiii, f. 5, 6; cxv, f. 2; cxvi, f. 5; cxvii, f. 6; cxxxv, f. 15, 18, 22, 1889.
Potomac formation: Near Potomac Run, Trents Reach, Dutch Gap Canal, Virginia.

Athrotaxopsis grandis Font. Potomac Fl., p. 240, pl. cxiv, f. 1–3; cxvi, f. 1–4; cxxxv, f. 10, 1889.
Potomac formation: Fredericksburg and near Brooke, Virginia.

Athrotaxopsis pachyphylla Font. Potomac Fl., p. 242, pl. cxv, f. 1, 3; cxvii, f. 1, 3–5, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

Athrotaxopsis tenuicaulis Font. Potomac Fl., p. 241, pl. cxiv, f. 4, 5; cxv, f. 4; cxvi, f. 6; cxvii, f. 2, 1889.

Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia.

AZOLLOPHYLLUM Penhallow. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 77, 1890 [1891].

Azollophyllum primævum Penhallow in Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 77, f. 2, 1890.

Miocene?: Stump Lake, Similkameen Valley, British Columbia.

BAIERA Braun. Flora, 1841, p. 33, 1841. [Not seen.]

Baiera brevifolia Newby. Am. Journ. Sci., vol. xli, p. 199, pl. xiv, f. 3, 1891.

Kootanie: Great Falls, Montana.

Baiera foliosa Font. Potomac Fl., p. 213, pl. xciv, f. 13, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

Baiera incurvata Heer? Fl. Foss. Arct., vol. vi, abt. ii, p. 45, pl. xiii, f. 6, 1882; Newby., Fl. Amboy Clays, p. 60, pl. x, f. 6, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Baiera longifolia (Pom.) Heer. Fl. Foss. Arct., vol. iv, abt. i, p. 39, pl. viii, f. 6, 1877; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 9, pl. ii, f. 5, 1885 [1886].

Dicropteris longifolia Pomel. Bericht d. deutsch. Naturf. Gesell., 1847, p. 339, 1847.

Kootanie: Martin Creek, British Columbia.

BAIEROPSIS Fontaine. Potomac Fl., p. 205, 1889.

Baieropsis adiantifolia Font. Potomac Fl., p. 211, pl. xcii, f. 8, 9; xciii, f. 1–3; xciv, f. 2, 3, 1889.

Potomac formation: Fredericksburg, near Potomac Run, and near Telegraph Station, Virginia.

Baieropsis adiantifolia minor Font. Potomac Fl., p. 212, pl. xciv, f. 1, 1889.

Potomac formation: Fredericksburg, Virginia.

Baieropsis denticulata Font. Potomac Fl., p. 210, pl. xciii, f. 7, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

Baieropsis denticulata angustifolia Font. Potomac Fl., p. 210, pl. xcii, f. 7, 1889.

Potomac formation: Near Brooke, Virginia.

Baieropsis expansa Font. Potomac Fl., p. 207, pl. lxxxix, f. 1, 3; xci, f. 1; xci, f. 2; xcii, f. 5, 1889.

Potomac formation: Fredericksburg, Dutch Gap Canal, Trents Reach, Virginia.

Baieropsis foliosa Font. Potomac Fl., p. 209, pl. xciii, f. 4–6, 1889.

Potomac formation: Near Brooke, White House Bluff, Virginia.

Baieropsis longifolia Font. Potomac Fl., p. 210, pl. xci, f. 6, 1889.

Potomac formation: Near Telegraph Station, Virginia.

Baieropsis microphylla Font. Potomac Fl., p. 212, pl. xc, f. 6, 1889.
Potomac formation: Fredericksburg, Virginia.

Baieropsis pluripartita Font. Potomac Fl., p. 208, pl. lxxxix, f. 4; xc, f. 2–5; xci, f. 1, 3, 4, 7; xcii, f. 1, 2, 6, 1889.
Potomac formation: Trents Reach, Dutch Gap Canal, Virginia.

Baieropsis pluripartita minor Font. Potomac Fl., p. 208, pl. xci, f. 5; xcii, f. 3, 4, 1889.
Potomac formation: Trents Reach, Dutch Gap Canal, Virginia.

Baieropsis sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 87, 1892.
Kootanie: Anthracite, British Columbia.

BANKSIA Linnæus. f. Suppl., p. 15, 1781.

Banksia helvetica Heer. Fl. Tert. Helv., vol. ii. p. 98, 1856; Lx., Trans. Am. Phil. Soc., vol. xiii, p. 418, pl. xvi, f. 6, 1869.
Eolignitic: Mississippi.

Banksia pusilla Vel. Fl. Bœhm. Kreidefl., Theil ii, p. 7 [32], pl. i [ix], f. 14–17, 1883; Hollick, Trans. N. Y. Acad. Sci., vol. xvi, p. 132, pl. xiii, f. 7, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

BANKSITES Saporta. Études sur la Végétation d. Sud-Est de la France, à l'Époque Tertiaire, pt. i, p. 103, Paris, 1863.

Banksites lineatus Lx. Cret. and Tert. Fl., p. 165, pl. xxxii, f. 21, 1883.
Green River group: Florissant, Colorado.

BAUHINIA Linnæus. Gen., ed. i, p. 126, 1737.

Bauhinia cretacea Newby. Bull. Torr. Bot. Club, vol. xiii, no. 5, p. 77, pl. lvi, 1886; Fl. Amboy Clays, p. 91, pl. xliii, f. 1–4; xliv, f. 1–3, 1895 [1896].
Cretaceous clays: New Jersey.

Bauhinia ? gigantea Newby. Fl. Amboy Clays, p. 93, pl. xx, f. 1, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

BENNETTITES Carruthers. Trans. Linn. Soc., London, vol. xxvi, p. 681, 1868.

Bennettites dacotensis McBride=Cycadeoidea dacotensis.

Bennettites sp., Carruthers=Cycadeoidea marylandica.

BENZOIN Fabric. Enum. Pl. Hort. Helmst, 1763.

Benzoin Masoni (Lx.) n. comb.
Lindera Masoni Lx. Fl. Dak. Gr., p. 96, pl. xviii, f. 9, 10, 1892.
Dakota group: Kansas.

Benzoin antiquum ? Heer. Fl. Tert. Helv., vol. ii, p. 81, pl. xc, f. 1–8, 1855; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 379, 1872 [1873]. [Not later mentioned by Lesquereux.]
——— ?: Golden, Colorado.

Benzoin venustum (Lx.) n. comb.
Lindera venusta Lx. Fl. Dak. Gr., p. 95, pl. xvi, f. 1, 2, 1892.
Dakota group: Kansas.

BERBERIS (Tournefort) Linnæus. Gen., ed. i, p. 94, 1737.

Berberis simplex Newby. Proc. U. S. Nat. Mus., vol. v, p. 514, 1882 [1883].
Miocene ?: Bridge Creek, Oregon.

BERCHEMIA Necker. Elem., vol. ii, p. 122, 1790.

Berchemia multinervis (Al. Br.) Heer. Fl. Tert. Helv., vol. iii, p. 77, pl. cxxiii, f. 9–18, 1859; Lx., Tert. Fl., p. 277, pl. lii, f. 9, 10, 1878; **Ward,** Bull. U. S. Geol. Surv. no. 37, p. 73, pl. xxxiii, f. 1 [non f. 2], 1887.
Rhamnus multinervis Al. Br. In Buckl. Geol., vol. i, p. 513, 1836.
Berchemia parviflora Lx. Am. Journ. Sci., vol xlv., 2d ser., p. 207, 1868.
Fort Union group: Bull Mountains, Montana.
Denver group: Golden, Sedalia, Colorado.
Laramie group: Raton Mountains, New Mexico ?.
Miocene: John Day Valley, Oregon.

Berchemia multinervis (Al. Br.) Ward = Rhamnus goldianus.

Berchemia parvifolia Lx. = Berchemia multinervis.

BETULA (Tournefort) Linnæus. Syst., ed. i, 1735.

Betula æqualis L. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 2., pl. i, f. 2–4, 1878.
Miocene: Chalk Bluffs, California.

Betula alaskana Lx. Proc. U. S. Nat. Mus., vol. v, p. 446, pl. vi, f. 14, 1882 [1883].
Eocene ?: Chignik Bay, Alaska.

Betula angustifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 508, 1882 [1883].
Miocene ?: Bridge Creek, Oregon.

Betula basiserrata Ward. Bull. U. S. Geol. Surv. no. 37. p. 32, pl. xiv, f. 4, 1887.
Fort Union group: Seven Mile Creek, Montana.

Betula beatriciana Lx. Am. Journ. Sci., vol. xlvi, p. 95, 1868.
Dakota group: Beatrice, Nebraska.

Betula caudata Göpp. Lx. = Betula Stevensoni Lx.

Betula coryloides Ward. Bull. U. S. Geol. Surv. no. 37, p. 31, pl. xiv, f. 3, 1887.
Fort Union group: Seven Mile Creek, Montana.

Betula elliptica Sap. Climat et Vég. Tert., p. 160, 1861; Lx., Cret. and Tert. Fl., p. 242, pl. li, f. 6, 1883.
Miocene: John Day Valley, Oregon.

Betula fallax Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 45, 1888.
Denver group: Golden, Colorado.

Betula florissanti Lx. Cret. and Tert. Fl., p. 150, pl. xxvii, f. 11, 1883.
Green River group: Florissant, Colorado.

Betula Göpperti Lx. = Betula Stevensonii.

Betula gracilis? Ludw. Paleontogr., vol. viii, p. 99, pl. xxxii, f. 3–6, 1861; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 397, 1873 [1874]; Tert. Fl., p. 138, pl. xvii, f. 20, 1878.
Denver group: Golden, Colorado.

Betula grandifolia Ett. Foss. Fl. v. Bilin: Denkschr. Wien. Akad., vol. xxvi, p. 123, pl. xiv, f. 23, 25, 1867; Heer., Fl. Foss. Alaska, p. 29, pl. v, f. 8, 1868.

Eocene?: Port Graham, Alaska.

Betula heterodonta Newby. Proc. U. S. Nat. Mus., vol. v, p. 509, 1882 [1883].

Miocene?: Bridge Creek, Oregon.

Betula lutea? Mx. f. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 66, 70, 1896.

Pleistocene: Besserers Wharf, Ottawa River.

Betula MacClintockii Cramer in Heer. Fl. Foss. Arct., vol. i, p. 174, pl. xxxiv, f. 4*a*, *b*; xxxix, f. 1–9, 1868.

Tertiary: Banks Land.

Betula nigra L. Knowlton, Am. Geol., vol. xviii, p. 371, 1896.

Glacial: Morgantown, West Virginia.

Betula parce-dentata Lx. Cret. and Tert. Fl., p. 242, pl. l, f. 12, 1883.

Miocene: John Day Valley, Oregon.

Betula perantiqua Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 27, pl. vii, f. 27, 1882 [1883].

Upper Cretaceous: Baynes Sound, Port McNeill.

Betula prisca Ett. Foss. Fl. v. Wien., p. 11, pl. i, f. 15–17, 1851; Ward, Bull. U. S. Geol. Surv., no. 37, p. 31, pl. xiv, f. 2, 1887.

Fort Union group: Seven-Mile Creek, Montana.

Eocene?: Alaska.

Betula Schimperi Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 45, 1888.

Denver group: Golden, Colorado.

Betula Stevensonii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 293, 1871 [1872]; Tert. Fl., p. 139, pl. xviii, f. 1–5, 1878.

Betula Göpperti Lx. Tert. Fl., p. 138, pl. xvii, f. 21–23, 1878.

Betula! caudata? Göpp. Lx. Ann. Rept. op. cit., p. 293, 1871 [1872].

Laramie group?: Carbon and Evanston, Wyoming; British Columbia.

Betula truncata Lx. Cret. and Tert. Fl., p. 150, pl. xxviii, f. 7, 8, 1883.

Green River group: Florissant, Colorado.

Betula Vogdesii Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 386, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 312, 1874 [1876]; Tert. Fl., p. 137, pl. xvii, f. 18, 19, 1878.

———: Fort Fetterman.

Betula sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 34, 1887. [Fossil wood.]

Canadian upper Laramie: Souris River.

Betula sp., Dn. Geol. Surv. Canada, Rept. of Progress for 1872–73, append. i, p. 68, 1873.

Cretaceous: Vancouver Island, British Columbia.

Betula sp., Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 22, 1882 [1883].

———: Peace River, Northwest Territory.

Betula sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]
Belly River series: Ribstone Creek, Canada.
Fort Pierre series: Swift Current, Canada.

Betula? sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 89, f. (in text) 30, 1890.
Eocene?: Similkameen Valley, British Columbia.

Betula sp., Heer. Fl. Foss. Arct., vol. i, p. 137, pl. xxiii, f. 10, 1868.
Miocene?: Mackenzie River.

BETULITES Göppert. De Floribus in Statu Fossili, p. 22, Breslau, 1837.

Betulites denticulata Heer. Phyll. crét. d. Nebr., p. 15, pl. iv, f. 5, 6, 1866.
Dakota group: Blackbird Hill, Nebraska.

Betulites populifolius Lx. Fl. Dak. Gr., p. 64, pl. vi, f. 1, 2, 1892.
Dakota group: Kansas.

Betulites rugosus Lx. Fl. Dak. Gr., p. 65, pl. vi, f. 3–5, 1892.
Dakota group: Kansas.

Betulites Snowii Lx. Fl. Dak. Gr., p. 64, pl. v, f. 1–4, 1892.
Dakota group: Kansas.

Betulites Westii Lx. Fl. Dak. Gr., p. 60, pl. iv, f. 1–22; pl. v, f. 5–14, 1892.
Dakota group: Kansas.

Betulites Westii crassus Lx. Fl. Dak, Gr., p. 63, pl. v, f. 15–17, 1892.
Dakota group: Kansas.

Betulites Westii cuneatus Lx. Fl. Dak. Gr., p. 62, pl. v, f. 8, 1892.
Dakota group: Kansas.

Betulites Westii grewiopsideus Lx. Fl. Dak. Gr., p. 63, pl. lxiv, f. 10, 1892.
Dakota group: Kansas.

Betulites Westii inæquilateralis Lx. Fl. Dak. Gr., p. 62, pl. v, f. 10–13, 1892.
Dakota group: Kansas.

Betulites Westii lanceolatus Lx. Fl. Dak. Gr., p. 62, pl. v, f. 14, 1892.
Dakota group: Kansas.

Betulites Westii latifolius Lx. Fl. Dak. Gr., p. 61, pl. iv, f. 9–11, 1892.
Dakota group: Kansas.

Betulites Westii multinervis Lx. Fl. Dak. Gr., p. 62, pl. iv, f. 20–23, 1892.
Dakota group: Kansas.

Betulites Westii oblongus Lx. Fl. Dak. Gr., p. 61, pl. iv, f. 17–19, 1892.
Dakota group: Kansas.

Betulites Westii obtusus Lx. Fl. Dak. Gr., p. 61, pl. iv, f. 5–8, 1892.
Dakota group: Kansas.

Betulites Westii populoides Lx. Fl. Dak. Gr., p. 63, 1892.
Dakota group: Kansas.

Betulites Westii quadratifolius Lx. Fl. Dak. Gr., p. 62, pl. v, f. 9, 1892.
Dakota group: Kansas.

Betulites Westii reniformis Lx. Fl. Dak. Gr., p. 62, pl. v, f. 5, 1892.
Dakota group: Kansas.

Betulites Westii rhomboidalis Lx. Fl. Dak. Gr., p. 62, pl. v. f. 6, 7, 1892.
Dakota group: Kansas.

Betulites Westii rotundatus Lx. Fl. Dak. Gr., p. 61, pl. iv, f. 12–16, 1892.
Dakota group: Kansas.

Betulites Westii subintegrifolius Lx. Fl. Dak. Gr., p. 61, pl. iv, f. 1–4, 1892.
Dakota group: Kansas.

Betulites, stipules of, Lx. Fl. Dak. Gr., p. 65, pl. v, f. 18, 1892.
Dakota group: Kansas.

BLECHNUM Linnæus. Sp. Pl., ed. ii, p. 1077, 1753.

Blechnum Göpperti Ett. Farnkräuter, p. 153, 1865; Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 283, 1871 [1872]. [Not afterwards recognized by Lesquereux.]
Green River group?: Henry's Fork.

BOMBAX Linnæus. Sp. Pl., ed. i, p. 511, 1753.

Bombax virginiensis Font. Potomac Fl., p. 310, pl. cli, f. 4, 1889.
Potomac formation: Near Brooke, Virginia.

BRACHYPHYLLUM Brongniart. Prodrome d'une Hist. d. Vég. Foss., Paris, 1828, p. 109.

Brachyphyllum crassicaule Font. Potomac Fl., p. 221, pl. c, f. 4; cix, f. 1–7; cx, f. 1–3; cxi, f. 6–7; cxii, f. 6–8; clxviii, f. 9, 1889.
Potomac formation: Trents Reach, near Brooke, and near Dutch Gap Canal, Virginia.

Brachyphyllum crassum Lx. = Brachyphyllum macrocarpum.

Brachyphyllum macrocarpum Newby. Fl. Amboy Clays, p. 51, [foot-note] 1895 [1896].

Brachyphyllum crassum* Lx. Proc. U. S. Nat. Mus., vol. x, p. 34, 1887; Fl. Dak. Gr., p. 32, pl. ii, f. 5, 1891; Newby, Fl. Amboy Clays, p. 51, pl. vii, f. 1–7, 1895 [1896].
Thuites crassus Lx. Cret. and Tert. Fl., p. 32, 1883 [1884].
Brachyphyllum sp. Kn. Bull. Geol. Soc. Am., vol. viii, p. 137, 1897.
[* B. crassum Lx., antedated by B. crassum of Tenison-Woods, 1883.]

Dakota group: Kansas.
Amboy clay: New Jersey.
Montana formation: Harper Station, Wyoming; North Fork Dutton Creek, Wyoming.
Age?: Upper Kanab Valley, Utah.

Brachyphyllum parceramosum Font. Potomac Fl., p. 223, pl. cx, f. 4, 1889.
Potomac formation: Near Telegraph Station, Virginia.

Brachyphyllum texense Font. Proc. U. S. Nat. Mus., vol. xvi, p. 269, pl. xxxviii, f. 3–5; pl. xxxix, f. 1, 1*a*, 1893.
Trinity division: Glenrose, Texas.

Brachyphyllum sp. (Cone) Font. Potomac Fl., p. 224, pl. clxviii, f. 2, 1889.
Potomac formation: Trents Reach, Virginia.

Brachyphyllum sp. (Cone), Font. Potomac Fl., p. 223, pl. cxxxv, f. 8, 1889.
Potomac formation: Trents Reach, Virginia.

Brachyphyllum sp. (Cone), Font. Potomac Fl., p. 224, pl. cxxxv, f. 9, 1889.
Potomac formation: Trents Reach, Virginia.

Brachyphyllum sp. Kn. (1897)=Brachyphyllum macrocarpum.

BRASENIA Schreber. Gen Pl., p. 372, 1789.

Brasenia antiqua Newby. Proc. U. S. Nat. Mus., vol. v, p. 514, 1882 [1883.]
Eocene: Green River, Wyoming.

Brasenia antiqua Dn.=Nelumbo Dawsoni.

Brasenia peltata Pursh. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 326, 1890.
Pleistocene: Greens Creek, Ottawa.

BROMELIA (Plumier) Linnæus. Syst., ed. i, 1735.

Bromelia? tenuifolia Lx. Fl. Dak. Gr., p. 41, pl. i, f. 13, 1891.
Dakota group: Kansas.

BROMUS Dillenius ex Linnæus. Syst., ed. i, 1735.

Bromus ciliatus L. Penhallow, Bull. Geol. Soc. Am. vol. i., p. 332, 1890.
Pleistocene: Greens Creek, Ottawa River, Canada.

BRYUM (Dillenius) Linnæus. Gen. Pl., p. 323, 1737.

Bryum sp., Hinde. Canadian Journal [Can. Institute], vol. xv, p. 399, 1878.
Interglacial: Scarboro Heights, Ontario.

BUMELIA Swartz. Prodr. Veg. Ind. Oce., p. 49, 1788.

Bumelia florissanti Lx. Cret. and Tert. Fl., p. 174, pl. xxxiv, f. 4, 5, 1883.
Green River Group: Florissant, Colorado.

Bumelia Marcouana (Heer.) Lx.=Liriodendron primævum.

Bumelia? rhomboidea Lx. Fl. Dak. Gr., p. 113, pl. li, f. 10, 1892.
Dakota Group: Kansas.

CABOMBA Aublet. Pl. Gui., vol. i, p. 321, 1775.

Cabomba gracilis Newby. Proc. U. S. Nat. Mus., vol. v, p. 514, 1882 [1883].
Fort Union group: Fort Union, North Dakota.

Cabomba grandis Newby. Proc. U. S. Nat. Mus., vol. v, p. 514, 1882 [1883].
Fort Union group: Fort Union, North Dakota.

CÆSALPINIA Linnæus. Sp. Pl., p. 380, 1753.
Cæsalpinia Cookiana Hollick in Newby. Fl. Amboy Clays, p. 94, pl. xlii, f. 49, 50, 1895 [1896].
Amboy clay: New Jersey.
Cæsalpinia linearis Lx.=Mimosites linearifolius.

CALAMOPSIS Heer. Fl. Tert. Helv., vol. iii, p. 169, 1859.
Calamopsis Danai Lx. Trans. Am. Phil. Soc., vol. xiii, p. 411, pl. xiv, f. 1–3, 1869.
Eolignitic: Mississippi.
Callicoma microphylla? Ett. Lx.=Myrica drymeja.

CALLISTEMOPHYLUM Ettingshausen. Tert. Fl. v. Häring in Tirol, p. 83, 1853.
Callistemophyllum Heerii Ett. Sitzb. Wien. Akad., vol. lv, abt. i, p. 261, pl. iii, f. 9, 1867; Lx, Fl.. Dak. Gr., p. 138, pl. xxxviii, f. 8, 1892.
Dakota group: Kansas.
Callistemophyllum latum Dn. Trans. Roy. Soc. Canada, vol. vii, sec., iv, p. 72, pl. x, f. 8, 1889.
Miocene?: Mackenzie River.
Callitris? sp., Font. Potomac Fl., p. 272, pl. clxix, f. 8, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

CALYCITHES [**CALYCITES** Auct.] Massalongo. Schizzo Geognostico, p. 72, Verona, 1850.
Calycites diospyriformis Newby. Fl. Amboy Clays, p. 132, pl. xlvi, f. 39–41, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.
Calycites hexaphylla Lx.=Diospyros Wodani.
Calycites parvus Newby. Fl. Amboy Clays, p. 131, pl. xlvi, f. 28, 29, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.
Calycites polyçepalus Newby. Later Extinct Floras, p. 31, 1868.
[Not described, figured, or afterwards referred to.]
Calycites sp., Lx. Fl. Dak. Gr., p. 221, pl. xxii, f. 8, 1892.
Dakota group: Kansas.

CAREX (Dillenius) Linnæus. Syst., ed. i, 1735.
Carex aquatilis Whal. Macoun in Coleman, Journ. Geol., vol. iii, p. 626, 1895.
Pleistocene: Scarboro Heights, Ontario.
Carex Berthoudi Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 377, 1872 [1873]; Tert. Fl., p. 92, pl. ix., f. 3, 4, 1878.
Denver group: Golden, Colorado.

Carex burrardiana Penhallow in Dn. Trans. Roy. Soc. Canada, 2d ser., sec. iv, p. 145, pl. iv., f. 6, 1895–96.
Eocene: Burrard Inlet, Vancouver City, British Columbia.

Carex majellanica Lam. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 325, 1890.
Pleistocene: Greens Creek, Ottawa River, Canada.

Carex servata Heer. Fl. Foss. Alask., p. 24, pl. i, f. 13, 13*c*, *d*, 1869.
Eocene?: Port Graham, and Herendeen Bay, Alaska.

Carex utriculata Boott. Macoun in Coleman, Journ. Geol., vol. iii, p. 626, 1895.
Pleistocene: Scarboro Heights, Ontario.

Carex vancouverensis Penhallow in Dn. Trans. Roy. Soc. Canada, 2d ser., vol. i, sec. iv, p. 144, pl. iv, f. 5, 1895–96.
Eocene: Stanley Park, British Columbia.

CARPINUS Linnæus. Gen., ed. i, p. 292, 1737.

Carpinus attenuata Lx. Cret. and Tert. Fl., p. 152, pl xxvii, f. 10, 1883.
Green River group: Florissant, Colorado.

Carpinus fraterna Lx. Cret. and Tert. Fl., p. 152, pl. xxvii, f. 12–14, 1883.
Green River group: Florissant, Colorado.

Carpinus grandis Ung. Synop. Pl. Foss., p. 220, 1845; Lx., Am. Journ. Sci., vol. xxxii, p. 360, 1861; Geol. Vt., vol. ii, p. 716, f. 151?, 1861; Newby, Bost. Journ. Nat. Hist., vol. vii., p. 519, 1863; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 313, 1874 [1876]; Tert. Fl., p. 143, pl. xix, f. 9; lxiv, f. 8–10, 1878.
Quercus elkoana Lx. Ann. Rept., p. 413, 1873 [1874].
Miocene: John Day Valley, Oregon.
Eocene: Cook Inlet, Alaska; Stump Lake, British Columbia; ? Brandon, Vermont.
Green River group: Florissant, Colorado; Elko Station, Nevada.

Carpinus pyramidalis (Göpp.) Heer. Fl. Tert. Helv., vol. iii, p. 177, pl. lxxxvii, f. 7*b*.; cl, f. 27, 28, 1859; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 18, 1888.
Miocene: John Day Valley, Oregon.

CARPITES Schimper. Pal. Vég., vol. iii, p. 421, 1874.

Carpites bursæformis Lx. Tert. Fl., p. 306, pl. lx, f. 30, 1878.
Laramie group: Black Buttes, Wyoming.

Carpites cocculoides (Heer.) Lx. Tert. Fl., p. 307, pl. lx, f. 32–35, 1878.
Carpolithes cocculoides Heer. Fl. Foss. Arct., vol. ii, p. 484, pl. lii, f. 9, 1869.
Laramie group?: Carbon, Wyoming.

Carpites cocculoides major Lx. Tert. Fl., p. 307, pl. lx, f. 38, 39, 1878.
Laramie group?: Carbon, Wyoming.

Carpites coffeæformis Lx. Tert. Fl., p. 303, pl. lx, f. 6, 7, 1878.
Denver group: Golden, Colorado.

Carpites coniger Lx. Fl. Dak. Gr., p. 221, pl. lxii, f. 5, 1892.
Dakota group: Kansas.

Carpites cordiformis Lx. Fl. Dak. Gr., p. 220, pl. xxii, f. 9, 1892.
Dakota group: Kansas.

Carpites costatus Lx. Tert. Fl., p. 303, pl. lx, f. 5, 1878.
Denver group: Golden, Colorado.

Carpites fragariæformis Lx. Proc. U. S. Nat. Mus., vol, xi, p. 16, 1888.
Miocene: John Day Valley, Oregon.

Carpites gemmaceus Lx. Cret. and Tert. Fl., p. 204, pl. xl, f. 19, 1883.
Green River group: Florissant, Colorado.

Carpites glumæformis Lx. Tert. Fl., p. 304, pl. xxxv, f. 4*d*; pl. lx, f. 14–17, 1878.
Laramie group: Black Buttes, Wyoming.

Carpites laurineus Lx. Tert. Fl., p. 304, pl. lx, f. 20, 21, 1878.
Laramie group: Golden, Colorado.

Carpites ligatus Lx. Tert. Fl., p. 307, pl. lx, f. 36, 36*a*, 1878.
Laramie group: Placer Mountain, New Mexico.

Carpites lineatus (Newby.) Lx. Tert. Fl., p. 302, pl. lx, f. 1-1*d*, 1878.
Carpolithus lineatus Newby.. Later Extinct Floras, p. 31, 1868.
Laramie group?: Evanston, Wyoming.

Carpites liriophylli ? Lx. Cret. and Tert. Fl., p. 77, pl. xi, f. 5, 1883.
Dakota group: Morrison, Colorado.

Carpites milioides Lx. Cret. and Tert. Fl., p. 204, pl. xl, f. 18, 1883.
Green River group: Florissant, Colorado.

Carpites minutulus Lx. Tert. Fl., p. 305, pl. lx, f. 25, 1878.
Denver group: Golden, Colorado.

Carpites mitratus Lx. Tert. Fl., p. 304, pl. lx, f. 18, 19, 1878.
Laramie group: Black Buttes, Wyoming.

Carpites oviformis Lx. Tert. Fl., p. 302, pl. xxx, f. 6*a*, 1878.
Denver group: Golden, Colorado.

Carpites Pealei Lx. Tert. Fl., p. 306, pl. lx, f. 31, 1878.
Green River group: Florissant, Colorado.

Carpites rhomboidalis Lx. Tert. Fl., p. 306, pl. lx, f. 28, 29, 1878.
Laramie group: Golden, Colorado.

Carpites rostellatus Lx. = Ginkgo.

Carpites spiralis Lx. Tert. Fl., p. 306, pl. lx, f. 27, 1878.
Carpolithes spiralis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 16, 1871 [1872].
Laramie group: Placer Mountain, New Mexico.

Carpites tiliaceus (Heer.) Lx. Fl. Dak. Gr., p. 221, pl. xxii, f. 6, 7, 1892.
Carpolithes tiliaceus Heer. Mioc. Balt. Fl., p. 101, pl. xxx, f. 42, 43, 1869.
Dakota group: Kansas.

Carpites triangulosus Lx. Tert. Fl., p. 302, pl. lx, f. 4; p. lxii, f. 19, 20, 1878.
Denver group: Golden, Colorado.
Laramie group?: Black Buttes, Wyoming?; Carbon, Wyoming.

Carpites utahensis Lx. Tert. Fl., p. 305, pl. lx, f. 22, 1878.
Laramie group?: Evanston, Wyoming.

Carpites valvatus Lx. Tert. Fl., p. 307, pl. lx, f. 37, 1878.
Laramie group?: Fort Steele, Wyoming.

Carpites verrucosus Lx. Tert. Fl., p. 305, pl. lx, f. 23, 1878.
Laramie group: Black Buttes, Wyoming.

Carpites Viburni Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 382, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 308, 1874 [1876]; Tert. Fl., p. 305, pl. lx, f. 26, 26*a*, 1878.
Laramie group: Black Buttes, Wyoming.

Carpites? sp., Lx. Fl. Dak. Gr., p. 221, 1892.
Carpolithes? Lx. Cret. Fl., p. 114, pl. xxvii, f. 5; pl. xxx, f. 11, 1874.
Dakota group: Kansas?.

CARPOLITHES Schlotheim. Petrefactenkunde, p. 418, 1820.

Carpolithes arachioides Lx.=Leguminosites? arachioides.

Carpolithes brandoniana Lx. Am. Journ. Sci., vol. xxxii, p. 356, 1861; Geol. Vt., vol. ii, p. 713, 1861.
———: Brandon, Vermont.

Carpolithes brandoniana elongata Lx. Am. Journ. Sci., vol. xxxii, p. 356, 1861; Geol. Vt., vol. ii, p. 713, f. 111–113, 1861.
———: Brandon, Vermont.

Carpolithes brandoniana obtusa Lx. Am. Journ. Sci., vol. xxxii, p. 356, 1861; Geol. Vt., vol. ii, p. 713, f. 114–117, 1861.
———: Brandon, Vermont.

Carpolithes bursæformis Lx. Am. Journ. Sci., vol. xxxii, p. 359, 1861; Geol. Vt., vol. ii, p. 715, f. 146, 147, 1861.
———: Brandon, Vermont.

Carpolithes cocculoides? Heer. Fl. Foss. Arct., vol. ii, abt. iv, p. 484, pl. lii, f. 9, 9*b*, 1869; Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 290, 1871 [1872]. [Not afterwards recognized by Lesquereux.]
Laramie group?: Carbon, Wyoming.

Carpolithes compositus Lx.=Palmocarpon compositum.

Carpolithes dentatus Penhallow in Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 89, f. (in text) 26, 1890.
Eocene?: Stump Lake, British Columbia.

Carpolithes falcatus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 398, 1872 [1873]. [Not afterwards recognized by its author.]
Laramie group?: Black Buttes, Wyoming.

Carpolithes fissilis Lx. Am. Journ. Sci., vol. xxxii, p. 356, 1861; Geol. Vt., vol. ii, p. 713, f. 118, 119, 124, 1861.
———: Brandon, Vermont.

Carpolithes Grayana Lx. Am. Journ. Sci., vol. xxxii, p. 356, 1861; Geol. Vt., vol. ii, p. 714, f. 122, 1861.

———: Brandon, Vermont.

Carpolithes horridus Dn.=Antholithes horridus.

Carpolithes irregularis Lx. Am. Journ. Sci., vol. xxxii, p. 356, 1861; Geol. Vt., vol. ii, p. 714, f. 120, 121, 123, 125, 128, 1861.

———: Brandon, Vermont.

Carpolithes Lescurii Hitchcock. Portland Soc. Nat. Hist., vol. i, pt. 1, p. 95, pl. i, f. 5, 1862.

———: Brandon, Vermont.

Carpolithes lineatus Newby. Later Extinct Floras, p. 31, 1868; Ill. Cret. and Tert. Pl., pl. xxv, f. 1, 1878; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 295, 1871 [1872].

Laramie group?: Evanston, Wyoming.

Carpolithes (Zamites) meridionalis Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 64, pl. x, f. 42, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver Island.

Carpolithes mexicanus Lx.=Palmocarpon mexicanum.

Carpolithes osseus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 404, 1872 [1873]. [Not afterwards recognized by its author.]

Eocene?: Elk Creek, Yellowstone National Park.

Carpolithes palmarum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 382, 1872 [1873]. [Not afterwards mentioned by its author.]

———?: Golden, Colorado.

Carpolithes seminulum Heer. Fl. Foss. Arct., vol. i, p. 139, pl. xxiii, f. 11, 1868.

Miocene?: Mackenzie River.

Carpolithes spiralis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 16, 1871 [1872]. [Not afterwards mentioned by author.]

Laramie group?: Placer Mountain, New Mexico.

Carpolithes Dn. Rept. on Geol. and Res. near 49th Parallel, appen. A, p. 330, 1875.

Lignitic Tertiary: West of Woody Mountain.

Carpolithes venosus? Sternb. Vers., vol. ii, p. 208, pl. 58, f. 18–20, 1833; Lx., Am. Journ. Sci., vol. xxxii, p. 361, 1861; Geol. Vt., vol. ii, p. 717, f. 159–160, 1861.

———: Brandon, Vermont.

Carpolithes sp., Dn. Trans. Roy. Soc. Canada, vol. vii, sec. iv, p. 72, 1889.

Eocene?: Mackenzie River.

Carpolithes sp., Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 29, 1882 [1883].

Upper Cretaceous: Baynes Sound.

Carpolithes sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 418, 1873 [1874].

Green River group: Near Florissant, Colorado.

Carpolithes sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 90, f. (in text) 15, 1892.
Kootanie: Anthracite, ? British Columbia.

CARPOLITHUS agglomeratus Font. Potomac Fl., p. 267, pl. cxxxiv, f. 5, 1889.
Potomac formation: Fredericksburg, Virginia.

Carpolithus brookensis Font. Potomac Fl., p. 268, pl. cxxxv, f. 2, 4; cxxxvi, f. 6; clxvii, f. 6, 1889.
Potomac formation: Near Brooke and near Dutch Gap Canal, Virginia.

Carpolithus conjugatus Font. Potomac Fl., p. 267, pl. cxxxiv, f. 9, 1889.
Potomac formation: Fredericksburg, Virginia.

Carpolithus curvatus Font. Potomac Fl., p. 269, pl. cxxxv, f. 17, 1889.
Potomac formation: Fredericksburg, Virginia.

Carpolithus drupæformis Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 134, pl. xi, f. 4, 4*a*, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Carpolithus fasciculatus Font. Potomac Fl., p. 265, pl. cxxxiv, f. 1, 1889.
Potomac formation: Fredericksburg, Virginia.

Carpolithus floribundus Newby. Fl. Amboy Clays, p. 133, pl. xlvi, f, 17-21, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Carpolithus geminatus Font. Potomac Fl., p. 267, pl. cxxxiv, f. 10, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Carpolithus Harveyi Font. Proc. U. S. Nat. Mus., vol. xvi, p. 278, pl. xliii, f. 3, 1893.
Trinity division: Glenrose, Texas.

Carpolithus hirsutus Newby. Fl. Amboy Clays, p. 134, pl. xlvi, f. 14, 14*a*, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.
Cretaceous: Marthas Vineyard.

Carpolithus latus Font. Potomac Fl., p. 269, pl. cxxxv, f. 3, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Carpolithus mucronatus Font. Potomac Fl., p. 270, pl. cxxxvi, f. 15, 1889.
Potomac formation: Near Brooke, Virginia.

Carpolithus obovatus Font. Proc. U. S. Nat. Mus., vol. xvi, p. 278, pl. xliii, f. 5, 1893.
Trinity division: Glenrose, Texas.

Carpolithus ovæformis Newby. Fl. Amboy Clays, p. 134, pl. xlvi, f. 15, 16, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Carpolithus pruniformis Newby. Fl. Amboy Clays, p. 133, pl. xlvi, f. 42, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Carpolithus sessilis Font. Potomac Fl., p. 269, pl. cxxxvi, f. 9, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Carpolithus spinosus Newby. Proc. U. S. Nat. Mus., vol. v, p. 514, 1882 [1883].
Laramie group: Purgatory River, New Mexico.

Carpolithus ternatus Font. Potomac Fl., p. 265, pl. cxxxiv, f. 2–4, 6, 8, 1889.
Potomac formation: Fredericksburg, Virginia.

Carpolithus virginiensis Font. Potomac Fl., p. 266, pl. cxxxiv, f. 11–14; cxxxv, f. 1, 5; clxviii, f. 7, 1889.
Potomac formation: Near Telegraph and Station near Dutch Gap Canal, Virginia.
Kootanie: Great Falls, Montana.

Carpolithus woodbridgensis Newby. Fl. Amboy Clays, p. 133, pl. xlvi, f. 22, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Carpolithus sp., Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 38, pl. i, f. 12, 1892.
Cretaceous: Kreischerville, Staten Island.

Carya antiquorum Newby. = Hicoria antiquorum.

Carya bilinica (Ung.) Ett. = Hicoria juglandiformis.

Carya Bruckmani Heer. = Hicoria Bruckmani.

Carya elænoides (Ung.) Heer. = Hicoria elænoides.

Carya Heerii (Ett.) Heer. Fl. Tert. Helv., vol. iii, p. 93, 1859; Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 289, 1871 [1872]. [Not afterwards recognized by Lesquereux.]
Juglans Heerii Ett. Foss. Fl. v. Tokay: Sitzb. Wien. Akad. vol. xi, p. 35, [811] pl. ii, f. 5–7, 1853.
Green River group?: Green River, Wyoming.?

Carya olivæformis Nutt. Lx. = Hicoria pecan.

Carya rostrata (Göpp.) Schimp. = Hicoria rostrata.

Carya vermontana Lx. = Hicoria vermontana.

Carya verrucosa Lx. = Hicoria verrucosa.

Carya sp., Dn. = Hicoria sp.

CASSIA (Tournefort) Linnæus. Syst., ed. i, 1735.

Cassia Fischeri Heer. Fl. Tert. Helv., vol. iii. p. 119, pl. cxxxvii, f. 62–65, 1859; Lx., Cret. and Tert. Fl., p. 202, 1883.
Green River group: Florissant, Colorado.

Cassia concinna? Heer. Fl. Tert. Helv., vol. iii, p. 122, pl. cxxxviii, f. 41, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 402, 1872 [1873]; Tert. Fl., p. 299, pl. lix, f. 8, 8*a*, 1878.
Laramie group: Evanston, Wyoming.

Cassia obtusa Kn. 18th Ann. Rept. U. S. Geol. Surv., pt. iii, p. 731, pl. c, f. 4, 5, 1898.
Payette formation: Marsh, Idaho.

Cassia phaseolites ? Ung. Denkschr. Wien. Akad., vol. ii, p. 188, pl. lxv, f. 1–5; lxvi, f. 1–9, 1850; Lx, Proc. U. S. Nat. Mus., vol. xi, p. 16, 1888.
Miocene: John Day Valley, Oregon.

Cassia polita Lx. Fl. Dak. Gr., p. 146, 1892.
Dakota group: Kansas.

Cassia problematica Lx. Fl. Dak. Gr., p. 146, pl. xxxviii, f. 3, 1892.
Dakota group: Kansas.

CASTALIA Salisbury. In Ann. Bot., vol. ii, p. 71, 1805.

Castalia sp. (Lx.) n. comb.
Nymphæa sp., Lx. Proc. U. S. Nat. Mus., vol. x, p. 45, 1887.
———: "Mouth of Indian Creek."

Castalia sp., Kn. Bull. Geol. Soc. Am., vol. 8, p. 133, 1897.
Laramie group: Lance Creek, Converse County, Wyoming.

Castalia sp., Kn. Bull. Geol. Soc. Am., vol. 8, p. 133, 1897.
Laramie group: Lance Creek, Converse County, Wyoming.

Castalia sp., Kn. Bull. Geol. Soc. Am., vol. 8, p. 140, 1897.
Laramie group?: North Fork Dutton Creek, Wyoming.

CASTANEA Adanson. Fam. Pl., vol. ii, p. 375, 1763.

Castanea atavina Ung. Denkschr. Wien. Akad., vol. ii, p. 164, pl. xxxi, f. 5–7, 1850; Lx., Cret. and Tert. Fl., p. 247, pl. li, f. 2, 1883.
Miocene: John Day Valley, Oregon.

Castanea castaneæfolia (Ung.) n. comb.
Fagus castaneæfolia Ung. Chlor. Prot., p. 104, pl. xxviii, f. 1, 1847.
Castanea Ungeri Heer. Phil. Trans., vol. 159, p. 470, pl. xlv, f. 1–3; xlvi, f. 8, 1869; Lx., Cret. and Tert. Fl., p. 246, pl. lii, f. 1, 3–7, 1883.
Miocene?: Corral Hollow, California; John Day Valley, Oregon.
Eocene?: Alaska; Cherry Creek, Oregon; Kamloops, British Columbia.

Castanea intermedia Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 386, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 313, 1874 [1876]; Tert. Fl., p. 164, pl. xxi, f. 7, 1878.
Green River group: Middle Park, Colorado.

Castanea nana? Elliott. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 365, 1859 = Castanea pumila.

Castanea pumila Miller. Dict. ed. 8, 1768; Kn., Am. Geol., vol. xviii, p. 371, 1896.
Castanea nana? Elliott. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 365, 1859.
Pleistocene?: Banks of Mississippi River, near Columbus, Kentucky.
Glacial: Morgantown, West Virginia.

Castanea Ungeri Heer = Castanea castanæfolia.

Castanea sp., Dn. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 27, pl. i, f. 8, 1886 [1887].
Canadian Upper Laramie: Souris River.

Castanea sp., Hollick. Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Miocene?: Bridgeton, New Jersey.

CASTANOPSIS Spach. Hist. Veg. Phan., vol. xi, p. 185, 1842.
Castanopsis chrysophylloides Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 9, pl. ii, f. 10, 1878.
Miocene: Chalk Bluffs, California.

CASUARINA Linnæus. Amœn. Acad., vol. iv, p. 143, 1759.
Casuarina Covillei Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 353, pl. iii, f. 2, 1895.
Potomac formation: Mount Vernon, Virginia.

CATALPA Scopoli. Introd., p. 170, 1771.
Catalpa crassifolia Newby. Later Extinct Floras, p. 56, 1868.
Canadian upper Laramie: Bow River, Canada.
Fort Union group: Yellowstone River, Montana.

CAUDEX Lesquereux. Cret. and Tert. Fl., p. 91, 1883.
Caudex spinosus Lx. Cret. and Tert. Fl., p. 91, 1883.
Caulinites spinosa Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 422, 1872 [1873].
Dakota group: Kansas.

CAULERPITES (Brongniart) Sternberg. Vers., vol. ii, p. 20, 1833. [Fucoides § ix. Caulerpites Brongniart, Hist. Vég. Foss., p. 72, 1828.]
Caulerpites fastigiatus Sternb.=Sequoia fastigiata.
Caulerpites incrassatus Lx. Tert. Fl., p. 40, pl. i, f. 11, 12, 1878.
Delesseria incrassata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 374, 1872 [1873].
Laramie group: Raton Mountains, New Mexico.
Caulérpites lingulatus (Lx.) n. comb.
Delesseria lingulata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 374, 1872 [1873]; Tert. Fl., p. 41, 1878.
Laramie group: Raton Mountains, New Mexico.

CAULINITES Brongniart. Prod. Hist. Vég. Foss., p. 115, 1828.
Caulinites Beckeri Lx. Proc. U. S. Nat. Mus., vol. x, p. 36, pl. i, f. 3; ii, f. 2–4, 1887.
Pleistocene: Clear Lake, California.
Caulinites fecundus Lx.=Onoclea fecunda.
Caulinites sparganioides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 391, 1872 [1873]; Tert. Fl., p. 99, pl. xiv, f. 4–11, 1878.
Livingston beds: Bozeman coal field, Montana.
Laramie group: Black Buttes, Wyoming.
Caulinites spinosa Lx.=Caudex spinosus.

CEANOTHUS Linnæus. Act. Soc. Sci. Upsal., p. 77, 1741.
Ceanothus! americanus? L. Lesquereux. Am. Journ. Sci., vol. xxvii, p. 365, 1859.
Pleistocene: Banks of Mississippi River, near Columbus, Kentucky.
Ceanothus cinnamomoides Lx.=Zizyphus cinnamomoides.

Ceanothus cretaceous Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 28, pl. viii, f. 33, 1882 [1883].

Upper Cretaceous: Baynes Sound, Port McNeill, Vancouver Island.

Ceanothus fibrillosus Lx.=Zizyphus fibrillosus.

Ceanothus Meigsii Lx. Trans. Am. Phil. Soc., vol. xiii, p. 419, pl. xix, f. 5-7, 1869.

Eolignitic: Mississippi; Lagrange, Tennessee.

Ceanothus? sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 84, f. (in text) 14, 1890 [1891].

Eocene?: North Fork Similkameen River, British Columbia.

CEBATHA Forskal. Fl. Ægypt., p. 171, 1775.

Cebatha Haydeniana (Ward) n. comb.

Cocculus Haydenianus Ward. Bull. U. S. Geol. Surv., no. 37, p. 100, pl. xlvii, f. 1-4; pl. xlviii, f. 1, 1887.

Fort Union group: Burns's Ranch and Iron Bluff, Montana.

CEDROXYLON Kraus in Schimp. Trait. Pal. Vég., vol. ii, p. 370, 1870.

Cedroxylon sp., Dn. Rept. on Geol. and Res. near 49th Parallel, appen. A, p. 331, pl. xv, f. 1, 1875.

Lignitic Tertiary: "Forty-ninth parallel."

CELASTRINITES Saporta. Ann. sci. nat. Bot., 5th ser., vol. iii, p. 52, 1865.

Celastrinites ambiguus (Lx.) n. comb.

Celastrinites lævigatus Lx. Tert. Fl., p. 269, pl. xvii, f. 16, 16*a*, 1878.

Myrica ambigua Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 297, 1871 [1872].

Livingston beds: Bozeman coal field, Montana.

Celastrinites artocarpidioides Lx. Tert. Fl., p. 268, pl. xxxv, f. 3, 1878.

Artocarpidium olmediæfolium? Ung. Lx. Ann. Rept. U. S. Geol. and Geogr. Surv., Terr., p. 400, 1873 [1874].

Denver group: Golden, Colorado.

Celastrinites elegans Lx. Cret. and Tert. Fl., p. 185, pl. xxxi, f. 9, 10, 1883.

Green River group: Florissant, Colorado.

Celastrinites lævigatus Lx.=Celastrinites ambiguus.

CELASTROPHYLLUM Göppert. Die Tertiärflora auf d. Insel Java., 1854, p. 52. [This name was mentioned as a nomen nudum by Göppert in Neues Jahrb., 1853, p. 435.]

Celastrophyllum acutidens Font. Potomac Fl., p. 305, pl. clvi, f. 8, 1889.

Potomac formation: Near Brooke, Virginia.

Celastrophyllum angustifolium Newby. Fl. Amboy Clays, p. 100, pl. xiv, f. 8-17, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Celastrophyllum arcinerve Font. Potomac Fl., p. 304, pl. cxlvi, f. 3, 1889.
Potomac formation: Fredericksburg, Virginia.

Celastrophyllum Benedeni Sap. and Mar. Essai. Veg. Marnes Heers. Gelind., p. 67, pl. x, f. 6; pl. xii, f. 1, 2, 1874; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 58, pl. 177, f. 3, 4, 1894.
Cretaceous: Glen Cove, Long Island.

Celastrophyllum brittonianum Hollick in Newby. Fl. Amboy Clays, p. 105, pl. xliii, f. 37, 38, 46, 47, 1895 [1896].
Amboy clay: New Jersey.

Celastrophyllum brookense Font. Potomac Fl., p. 305, pl. clviii, f. 8; clix, f. 7, 1889.
Potomac formation: Virginia.

Celastrophyllum crenatum Heer. Fl. Foss. Arct., vol. vii, p. 41, pl. lxii, f. 21, 1883; Newby., Fl. Amboy Clays, p. 99, pl. xlviii, f. 1–19, 1895 [1896].
Amboy clay: South Amboy, and Sayreville, New Jersey.

Celastrophyllum crassipes Lx. Fl. Dak. Gr., p. 174, pl. lvii, f. 6, 7, 1892.
Dakota group: Kansas.

Celastrophyllum cretaceum Lx. Fl. Dak. Gr., p. 173, pl. xxxviii, f. 12–14, 1892; Newby., Fl. Amboy Clays, p. 100, pl. xlii, f. 13, 1895 [1896].
Dakota group: Kansas.
Amboy clay: New Jersey.

Celastrophyllum decurrens Lx. Fl. Dak. Gr., p. 172, pl. xxxvi, f. 1, 1892.
Dakota group: Kansas.

Celastrophyllum denticulatum Font. Potomac Fl., p. 306, pl. clxix, f. 10; clxxii, f. 7, 1889.
Potomac formation: Baltimore, Maryland.

Celastrophyllum ensifolium Lx. Cret. Fl., p. 108, pl. xxi, f. 2, 3, 1874.
Magnolia ensifolia Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 302, 1871 [1872].
Dakota group: Southern Kansas.

Celastrophyllum grandifolium Newby. Fl. Amboy Clays, p. 104, pl. xix, f. 8; xxi, f. 1–4, 1895 [1896].
Amboy clay: New Jersey.

Celastrophyllum Hunteri Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 358, pl. iv, f. 9, 1895.
Potomac formation: Mount Vernon, Virginia.

Celastrophyllum latifolium Font. Potomac Fl., p. 306, pl. clxxii, f. 3, 6; clxxiii, f. 13, 1889.
Potomac formation: Baltimore, Maryland.

Celastrophyllum minus Hollick in Newby. Fl. Amboy Clays, p. 105, pl. xlii, f. 51, 52, 1895 [1896].
Amboy clay: New Jersey.

Celastrophyllum myrsinoides Lx. Fl. Dak. Gr., p. 174, pl. lvii, f. 8, 9, 1892.
Dakota group: Kansas.

Celastrophyllum Newberryanum Hollick in Newby. Fl. Amboy Clays, p. 101, pl. xlix, f. 1–27, 1895 [1896]; Hollick, Trans. N. Y. Acad. Sci., vol. xvi, p. 133, pl. xiv, f. 1, 1897.
Amboy clay: South Amboy, Sayreville, New Jersey.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Celastrophyllum obliquum Lx. Fl. Dak. Gr., p. 173, pl. lvii, f. 5, 1892.
Dakota group: Kansas.

Celastrophyllum obovatum Font. Potomac Fl., p. 307, pl. clxxii, f. 9, 10, 1889.
Potomac formation: Baltimore, Maryland.

Celastrophyllum obtusidens Font. Potomac Fl., p. 305, pl. clvi, f. 5, 1889.
Potomac formation: Near Brooke, Virginia.

Celastrophyllum proteoides Font. Potomac Fl., p. 304, pl. cxlvi, f. 5, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Celastrophyllum robustum Newby. Fl. Amboy Clays, p. 103, pl. xlii, f. 41, 42, 1895 [1896].
Amboy clay: New Jersey.

Celastrophyllum spatulatum Newby. Fl. Amboy Clays, p. 103, pl. xlii, f. 43–45, 1895 [1896].
Amboy clay: New Jersey.

Celastrophyllum tenuinerve Font. Potomac Fl., p. 306, pl. clxxii, f. 2, 1889.
Potomac formation: Baltimore, Maryland.

Celastrophyllum undulatum Newby. Fl. Amboy Clays, p. 102, pl. xxxviii, f. 1–3, 1895 [1896].
Amboy clay: Woodbridge, Sayreville, New Jersey.

CELASTRUS Linnæus. Gen., ed. i, p. 59, 1737.

Celastrus alnifolius Ward. Bull. U. S. Geol. Surv., no. 37, p. 80, pl. xxxv, f. 1, 2, 1887.
Fort Union group: Burns's Ranch, Montana.

Celastrus arctica Heer. Fl. Foss. Arct., vol. vii, p. 40, pl. lxi, f. *5d*, *5e*, 1883; Newby., Fl. Amboy Clays, p. 98, pl. xiii, f. 8–18, 1895 [1896].
Amboy clay: South Amboy, New Jersey.

Celastrus borealis Heer. Fl. Foss. Alaska, p. 37, pl. x, f. 4, 1869.
Eocene?: Port Graham, Alaska.

Celastrus curvinervis Ward. Bull. U. S. Geol. Surv., no. 37, p. 82, pl. xxxvi, f. 3, 4, 1887.
Fort Union group: Burns's Ranch, Montana.

Celastrus ferrugineus Ward. Bull. U. S. Geol. Surv., no. 37, p. 78, pl. xxxiv, f. 1-4, 1887.
Fort Union group: Burns's Ranch, Iron Bluff, Montana.

Celastrus fraxinifolius Lx. Cret. and Tert. Fl., p. 184, pl. xxxiii, f. 2-4; pl. xl, f. 10, 1883.
Green River group: Florissant, Colorado.

Celastrus Gaudini Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 54, 1888.
Denver group: Golden, Colorado.

Celastrus Greithianus Heer. Fl. Tert. Helv., vol. iii, p. 70, pl. cxxi, f. 63, 1859; Lx., Cret. and Tert. Fl., p. 184, 1883.
Green River group: Florissant, Colorado.

Celastrus grewiopsis Ward. Bull. U. S. Geol. Surv., no. 37, p. 81, pl. xxxvi, f. 2, 1887.
Fort Union group: Burns's Ranch, Montana.

Celastrus Lacoei Lx. Cret. and Tert. Fl., p. 184, 1883.
Green River group: Florissant, Colorado.

Celastrus Lindgreni Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 732, pl. xcix, f. 13; c, f. 6, 1898.
Payette formation: Idaho City, Idaho.

Celastrus ovatus Ward. Bull. U. S. Geol. Surv., no. 37, p. 81, pl. xxxvi, f. 1, 1887.
Fort Union group: Iron Bluff, Montana.

Celastrus pterospermoides Ward. Bull. U. S. Geol. Surv., no. 37, p. 80, pl. xxxv, f. 3-6, 1887.
Fort Union group: Burns's Ranch and Iron Bluff, Montana.

Celastrus Taurinensis Ward. Bull. U. S. Geol. Surv., no. 37, p. 79, pl. xxxiv, f. 5, 6, 1887.
Fort Union group: Bull Mountains; Burns's Ranch, Montana.

Celastrus? sp., Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 38, pl. i, f. 4, 1892.
Cretaceous: Tottenville, Staten Island.

Celastrus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 130, 1897.
Montana formation: Harper, Wyoming.

CELTIS Tournefort ex Linnæus. Gen., ed. i, p. 337, 1737.

Celtis brevifolia Lx. Trans. Am. Phil. Soc., vol. xiii, p. 416, pl. xx, f. 4, 5, 1869.
Eolignitic: Mississippi.

Celtis McCoshii Lx. Cret. and Tert. Fl., p. 163, pl. xxxviii, f. 7, 8, 1883.
Green River group: Florissant, Colorado; Uinta County, formerly but erroneously called Randolph County, Wyoming.

Celtis? ovata Lx. = Ampelophyllum ovatum.

Celtis parvifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 510, 1882 [1883].
Tertiary: Tongue River, Wyoming.

Celtis rugosa Newby. Proc. U. S. Nat. Mus., vol. v, p. 510, 1882 [1883].
Tertiary: Tongue River, Wyoming.

CEPHALOTAXOPSIS Fontaine. Potomac Fl., p. 235, 1889.

Cephalotaxopsis brevifolia Font. Potomac Fl., p. 238, pl. cv, f. 3; cvi, f. 5; cvii, f. 5, 1889.
Potomac formation: Fredericksburg, near Dutch Gap Canal and near Potomac Run, Virginia.

Cephalotaxopsis magnifolia Font. Potomac Fl., p. 336, pl. civ, f. 4, 5; cv, f. 1, 2, 4; cvi, f. 1, 3; cvii, f. 1, 2, 4; cviii, f. 1, 3, 4, 1889.
Horsetown beds: Tehama County, California.
Potomac formation: Near Dutch Gap Canal and Fredericksburg, Virginia.

Cephalotaxopsis microphylla Font. Potomac Fl., p. 238, pl. cviii, f. 5; cix, f. 9, 1889.
Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia.

Cephalotaxopsis ramosa Font. Potomac Fl., p. 237, pl. civ, f. 2, 3; cvi, f. 2, 4; cvii, f. 3; cviii, f. 2, 1889.
Potomac formation: Fredericksburg and near Potomac Run, Virginia.

Cephalotaxopsis sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 89, 1892 [1893].
Kootanie: Anthracite, British Columbia.

Cephalotaxopsis sp., Font. In Diller and Stanton, Bull. Geol. Soc. Am., vol. v, p. 450, 1894.
Knoxville beds: Tehama County, California.

CERCIS Linnæus. Sp. Pl., ed. i, p. 374, 1753.

Cercis borealis Newby. Proc. U. S. Nat. Mus., vol. v, p. 510, 1882 [1883].
Fort Union group: Valley of the Yellowstone River.

Cercis eocenica Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 384, 1872 [1873]. [Not afterwards recognized by its author.]
Laramie group?: Erie, Colorado.

Cercis parvifolia Lx. Cret. and Tert. Fl., p. 201, pl. xxxi, f. 5–7, 1883.
Green River group: Florissant, Colorado.

Cercis truncata Lx. Cret. and Tert. Fl., p. 237, 1883.
Fort Union group: Bad Lands, Dakota.

CERCOCARPUS Humbolt Bonpland and Kunth Nov. Gen. et Sp., vol. vi, p. 232, 1823.

Cercocarpus antiquus Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 37, pl. x, f. 6–11, 1878; Cret. and Tert. Fl., p. 265, pl. xlvB, f. 2, 1883.
Miocene: Table Mountain, California.

CHAMÆCYPARIS Spach. Hist. Vég., Phan., vol. xi, p. 329, 1842.

Chamæcyparis thyoides (L.) B. S. P.

Cupressus thyoides L. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 73, 1896.

Pleistocene: New Jersey.

CHARA (Valliant) Linnæus. Gen. Pl., p. 326, 1737.

Chara compressa Kn. Bot. Gaz., vol. xiii, no. 6, p. 156, f. (in text) 1, 2, 1888.

Eocene: Wales, Utah.

Chara ? glomerata Lx. Cret. and Tert. Fl., p. 135, pl. xxi, f. 12, 1883.

Green River group: Florissant, Colorado.

Chara Stantoni Kn. Bot. Gaz., vol. xviii, no. 4, p. 141, f. (in text) 1–3 1893.

Bear River formation: Cookeville, Utah.

Chara sp., Hinde. Canadian Journal [Can. Institute], vol. xv, p. 399, 1878.

Interglacial: Scarboro Heights, Ontario.

CHIROPTERIS Kurr in Bronn: Neues Jahrb. f. Min. 1858, p. 143, 1858.

Chiropteris spatulata Newby. Am. Journ. Sci., vol. xli, p. 199, pl. xiv, f. 1, 2, 1891.

Kootanie: Great Falls, Montana.

Chiropteris Williamsii Newby. Am. Journ. Sci., vol. xli, p. 198, pl. xiv, f. 10, 11, 1891.

Kootanie: Great Falls, Montana.

CHONDRITES Sternberg. Vers., vol. ii, p. 25, 1833.

Chondrites bulbosus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 373, 1872 [1873]; Tert. Fl., p. 42, pl. i, f. 14, 1878.

Laramie group: Raton Mountains, New Mexico.

Chondrites flexuosus Newby. Fl. Amboy Clays, p. 34, pl. i, f. 1, 4, 1895 [1896].

Amboy clay: New Jersey.

Chondrites Heerii Eichwald. Geognost.-Palæontolog. Bemerk. ü. Halbinsell. Mangischlak und Aleut.-Inseln., p. 111, pl. iv, f. 1, 1871.

Chondrites sp., Heer. Fl. Foss. Alask., p. 21, pl. x, f. 5, 1869.

Eocene?: Kachemak Bay, Alaska.

Chondrites subsimplex Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 373, 1872 [1873]; Tert. Fl., p. 41, pl. i, f. 13, 1878.

Laramie group: Raton Mountains, New Mexico.

Chondrites sp., Heer=Chondrites Heerii.

CHONDROPHYLLUM Necker. Elem. Bot., iii, p. 347, 1790.

Chondrophyllum Nordenskiöldi Heer=Hedera ovalis?

Condrophyllum obovatum Newby. Fl. Amboy Clays, p. 118, pl. xlii, f. 26, 27, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Chondrophyllum orbiculatum Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 115, pl. xxxi, f. 3c; xxxii, f. 13, 1874; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 35, pl. ii, f. 2*b*, 1892.
Cretaceous: Staten Island.

Chondrophyllum orbiculatum Heer. Referred by Lesquereux to Hedera orbiculata (Heer) Lx.

Chondrophyllum reticulatum Hollick. In Newby., Fl. Amboy Clays, p. 119, pl. xli, f. 6, 7, 1895 [1896].
Amboy clay: New Jersey.

CINCHONIDIUM, Unger. Gen. et Sp. Plant. Foss., p. 430, 1850.

Cinchonidium ovale Lx. Cret. and Tert. Fl., p. 229, pl. xlviii, f. 8–10*b*, 1883.
Fort Union group: Bad Lands, Dakota.

CINNAMOMUM Blume. Bijdr., 568.

Cinnamomum affine Lx. Am. Journ. Sci., vol. xlv, p. 206, 1869; Tert. Fl., p. 219, pl. xxxvii, f. 1–5, 7, 1878.
Cinnamomum mississippiense Lx. Trans. Am. Phil. Soc., vol. xiii, p. 418, pl. xix, f. 2, 1869.
Cinnamomum polymorphum Al. Br. Lx. Tert. Fl., p. 221, pl. xxxvii, f. 6 [non f. 10], 1878.
Cinnamomum Rossmässleri Heer in Lx. Ann. Rept. op. cit., p. 379, 1872 [1873]; Tert. Fl., p. 221, 1878.
Montana group: Coalville, Utah.
Denver beds: Golden?, South Park, Colorado.
Laramie group: Durango, Marshalls, Colorado; ? Raton Mountains, New Mexico; Black Buttes, Wyoming; ? Carbon, Wyoming; Corrall Hollow, California.

Cinnamomum affine Lx. Ward, Bull. U. S. Geol. Surv., no. 37, p. 50, pl. xxiv, f. 3–5, 1887. [Non Lx.]=Ficus sp.
Laramie group: Black Buttes, Wyoming.

Cinnamomum canadense Dn. Trans. Roy. Soc., Canada, vol. iii, sec. iv, p. 13, pl. iv, f. 7, 1885 [1886].
Mill Creek series: Mill Creek?

Cinnamomum crassipes Lx. Am. Journ. Sci., vol. xxvii, p. 361, 1859.
———: Bellingham Bay.

Cinnamomum ellipsoideum Sap. and Mar. Mém. l'Acad. Roy. d. Belgique, vol. xli, p. 61, pl. ix, f. 7–9, 1878; Lx., Fl. Dak. Gr., p. 105, pl. li, f. 8, 9, 1892.
Dakota group: Kansas.

Cinnamomum ellipticum Kn. Bull. U. S. Geol. Surv., no. 105, p. 54, 1893.
Cinnamomum polymorphum Al. Br. Lx. Tert. Fl., p. 221, pl. xxxvii, f. 10 [non f. 6, which = *C. affine*, q. v.], 1878.
Livingston beds: Bozeman coal field, Montana.

Cinnamomum Heerii Lx. Am. Journ. Sci., vol. xxvii, p. 361, 1859; Trans. Am. Phil. Soc., vol. xiii, p. 431, pl. xxiii, f. 12, 1869; Cret. Fl., p. 84, pl. xxviii, f. 11, 1874; Cret. and Tert. Fl., p. 54; Fl. Dak. Gr., p. 105, pl, xv, f. 1, 1892.

Daphnogene Heerii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 343, 1874 [1876].

Dakota group: Kansas.

———?: Nanaimo.

Amboy clay?: South Amboy, New Jersey.?

Cinnamomum intermedium Newby. Fl. Amboy Clays, p. 89, pl. xxix, f. 1–8, 10, 1895 [1896].

Amboy clay: Woodbridge, Sayreville, New Jersey.

Cinnamomum lanceolatum? (Ung.) Heer. Fl. Tert. Helv., vol. ii, p. 86, pl. xciii, f. 6–11, 1856; Lx., Tert. Fl., p. 219, pl. xxxvi, f. 12, 1878. [Non Ward, Bull. U. S. Geol. Surv., no. 37, p. 49, pl. xxiv, f. 2, 1887.]

Daphnogene lanceolata Ung. Gen. et Sp., p. 424, 1850.

Laramie group: Evanston, Wyoming?

———: Upper Kanab Valley, Utah.

Cinnamomum lanceolatum (Ung.) Heer. Ward = Cinnamomum Wardii.

Cinnamomum Marioni Lx. Fl. Dak. Gr., p. 106, pl. li, f. 6, 7, 1892.

Dakota group: Kansas.

Cinnamomum mississippiense Lx. = Cinnamomum affine.

Cinnamomum novæ-angliæ Lx. Am. Journ. Sci., vol. xxxii, p. 360, 1861; Geol. Vt., vol. ii, p. 716, f. 148, 1861.

———? Brandon, Vermont.

Cinnamomum polymorphum = Cinnamomum affine.

Cinnamomum polymorphum = Cinnamomum ellipticum.

Cinnamomum Rossmässleri = Cinnamomum affine.

Cinnamomum Scheuchzeri Heer. Fl. Tert. Helv., vol. ii, p. 85, pl. xci, f. 4–22; pl. xcii; pl. xciii, f. 1, 5, 1856; Lx., Cret. Fl., p. 83, pl. xxx, f. 2, 3, 1874; Tert. Fl., p. 220, pl. xxxviii, f. 8, 1878; Fl. Dak. Gr., p. 104, pl. xi, f. 4, 1892.

Daphnogene cretacea Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 343, 1874 [1876].

Laramie group: Bozeman coal field, Montana.

Dakota group: Kansas; New Ulm, Minnesota.

Eocene?: Lassen County, California.

Cinnamomum sezannense Watlet. Pl. Foss. d. Bassin d. Paris, p. 175, pl. 50, f. 2, 1866; Lx., Fl. Dak. Gr., p. 107, pl. xii, f. 6, 7, 1892.

Dakota group: Kansas.

Cretaceous: Glen Cove and Sea Cliff, Long Island; Port McNeill, Vancouver Island.

Cinnamomum Wardii nom. nov.

Cinnamomum lanceolatum (Ung.) Heer. Ward, Bull. U. S. Geol. Surv., no. 37, p. 49, pl. xxiv, f. 2, 1887. [Non Lx.]

Laramie group: Hodges Pass, Wyoming.

Cinnamomum? sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 84, f. (in text) 15, 1890.
Eocene: North Fork Similkameen River, British Columbia.

Cinnamomum sp., Hollick. Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Miocene?: Bridgeton, New Jersey.

Cinnamomum sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 145, 1897.
Fort Union group: Black Buttes, Wyoming.

CISSITES Heer. Phyll. Crét. d. Nebraska, p. 19, Zürich, 1866.

Cissites acerifolius Lx. Fl. Dak. Gr., p. 163, pl. lviii, f. 1, 1892.
Dakota group: Kansas.

Cissites acuminatus Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 396, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 353, pl. viii, f. 1, 1874 [1876].
Dakota group: Fort Harker, Kansas.

Cissites acutiloba Hollick. Bull. Torr. Bot. Club, vol. xxii, p. 227, pl. 237, f. 3, 1895.
Dakota group: Fort Harker, Kansas.

Cissites affinis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 352, 1874 [1876]; Cret. and Tert. Fl., p. 67, 1883.
Platanus affinis Lx. Cret. Fl., p. 71, pl. iv, f. 4, 1874.
Populites affinis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 423, 1872 [1873].
Dakota group: Salina Valley, Kansas.
Mill Creek series: Mill Creek; North Fork Old Man River.

Cissites affinis ampla (Dn.) n. comb.
Platanus affinis ampla Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 12, 1885 [1886].
Mill Creek series: Mill Creek.

Cissites alatus Lx. Fl. Dak. Gr., p. 160, pl. xxiii, f. 6, 1892.
Dakota group: Kansas.

Cissites Brownii Lx. Fl. Dak. Gr., p. 162, pl. xviii, f. 11, 1892.
Dakota group: Kansas and Minnesota.

Cissites crispus Vel.? Fl. Böhm. Kreidefl., pt. iv, p. 12 [73], pl. iv [xxvii], f. 6, 1885; Newby., Fl. Amboy Clays, p. 108, pl. xlii, f. 20–23, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Cissites cyclophylla **Lx.**=Populites cyclophyllus.

Cissites dentato-lobatus Lx. Fl. Dak. Gr., p. 164, pl. lxvi, f. 4, 1892.
Dakota group: Kansas.

Cissites formosus Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 85, pl. xxi, f. 5–8, 1882; Lx., Fl. Dak. Gr., p. 161, pl. xxi, f. 5, 1892; Newby., Fl. Amboy Clays, p. 107, pl. xlvii, f. 1–8, 1895 [1896].
Dakota group: Kansas.
Amboy clay: New Jersey.
Cretaceous: Dorosis Island, Glen Cove, Long Island.

Cissites harkerianus Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 397, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 352, pl. vii, f. 1, 2, 1874 [1876].

Sassafras (Araliopsis) harkerianum Lx. Cret. Fl., p. 81, pl. xi, f. 3, 4; pl. xxvii, f. 2, 1874.

Sassafras harkeriana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 425, 1872 [1873].

Dakota group: Kansas.

Cissites Heerii Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 396, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 353, pl. vi, f. 3, 1874 [1876].

Dakota group: Fort Harker, Kansas.

Cissites ingens Lx. Fl. Dak. Gr., p. 159, pl. xix, f. 2, 2*a*, 1892.

Dakota group: Kansas.

Cissites ingens parvifolia Lx. Fl. Dak. Gr., p. 160, pl. lvii, f. 3, 4, 1892.

Dakota group: Kansas.

Cissites insignis Heer. Phyll. Crét. d. Nebr., p. 19, pl. ii, f. 3, 4, 1866.

Dakota group: Tekamah, Nebraska.

Cissites microphyllus Lx. Proc. U. S. Nat. Mus., vol. x, p. 44, pl. iii, f. 11, 1887.

Pleistocene?: Clear Lake, California.

Cissites obtusilobus Lx. Fl. Dak. Gr., p. 161, pl. xxxiii, f. 5, 1892.

Dakota group: Kansas.

Cissites obtusum Lx. = Cissites salisburiæfolius.

Cissites platanoidea Hollick. Bull. Torr. Bot. Club, vol. xxii, p. 226, pl. 237, f. 2, 1895.

Dakota group: Fort Harker, Kansas.

Cissites populoides Lx. Fl. Dak. Gr., p. 162, pl. xviii, f. 12–14, 1892.

Dakota group: Kansas.

Cissites salisburiæfolius Lx. Cret. and Tert. Fl., p. 66, 1883.

Populites salisburiæfolius Lx. Am. Journ. Sci., vol. xlvi, p. 94, 1868.

Sassafras obtusus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 424, 1872 [1873].

Cissites obtusum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 354, 1874 [1876].

Dakota group: Kansas and Nebraska.

CISSUS Linnæus. Diss. Dass., p. 6, 1747.

Cissus Browniana Lx. Geol. and Nat. Hist. Surv. Minn., vol. iii, p. 17, pl. A, f. 8, 1893.

Dakota group: New Ulm, Minnesota.

Cissus corylifolia Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 52, 1888.

Denver group: Golden, Colorado.

Cissus duplicato-serrata Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 52, 1888.

Denver group: Golden, Colorado.

Cissus lævigata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 380, 1872 [1873]; Tert. Fl., p. 238, pl. xl, f. 12, 13, 1878.
Denver beds: Golden, Colorado.
Arapahoe beds?: Sedalia, Colorado.

Cissus lobato-crenata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1872 [1873]; Tert. Fl., p. 240, pl. xli, f. 1–3, 1878.
Denver group: Golden, Mount Bross, Colorado.
Laramie group: Black Buttes, Wyoming.

Cissus parrottiæfolia Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 388, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 314, 1874 [1876]; Tert. Fl., p. 239, pl. xl, f. 15–17; pl. xlii, f. 1, 1878.
Denver beds: Golden, Colorado.
Green River group?: Medicine Bow, Wyoming.

Cissus tricuspidata (Heer) Lx. Tert. Fl., p. 240, pl. xli, f. 4–7, 1878.
Vitis (Cissus) tricuspidata Heer. Mioc. Balt. Fl., p. 91, pl. xxviii, f. 18, 19, 1869; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1872 [1873].
Laramie group: Black Buttes, Wyoming.

CLADOPHLEBIS Brongniart. Tab. des generes de vég. foss., p. 25, 1849.

Cladophlebis acuta Font. Potomac Fl., p. 74, pl. v, f. 7; pl. vii, f. 6; pl. x, f. 6, 7; pl. xi, f. 7, 8; pl. clxvi, f. 5, 1889.
Potomac formation: Potomac Run, and Dutch Gap Canal, Virginia.

Cladophlebis alata Font. Potomac Fl., p. 77, pl. xix, f. 5, 1889.
Potomac formation: Fredericksburg, Virginia.

Cladophlebis angustifolia Newby. Am. Journ. Sci., vol. xli, p. 200, pl. xiv, f. 8, 1891.
Kootanie: Great Falls, Montana.

Cladophlebis brevipennis Font. Potomac Fl., p. 81, pl. xxxvi, f. 1.
Potomac formation: Fishing hut above Dutch Gap Canal, Virginia.

Cladophlebis Browniana (Dunk.) Seward. Cat. Mesoz. Pl. Brit. Mus. Wealden Fl., pt. i, p. 99, 1894.
Pecopteris Browniana Dunk. Wealdenbildung, p. 5, 1846; Font., Potomac Fl., p. 88, pl. xxii, f. 10, 11; xxiii, f. 2–7; xxvi, f. 3, 13, 1889; Proc. U. S. Nat. Mus., vol. xv, p. 492, 1892; Dn., Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 84, f. (in text) 3, 1892 [1893].
Potomac formation: Fredericksburg, Dutch Gap Canal, and near Brooke, Virginia; Baltimore, Maryland.
Kootanie: Great Falls, Montana; Anthracite, British Columbia.

Cladophlebis columbiana Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 55, pl. v, f. 4, 5, 1893 [1894].
Cretaceous: Vancouver Island.

Cladophlebis constricta Font. Potomac Fl., p. 68, pl. ii, f. 11; pl. iii, f. 2; pl. vi, f. 5, 6, 8–14; pl. xxi, f. 9, 13; pl. clxix, f. 2, 1889.
Kootanie: Great Falls, Montana.
Potomac formation: Fredericksburg, Brooke Station, and Deep Bottom, Virginia: Baltimore, Maryland.

Cladophlebis crenata Font. Potomac Fl., p. 75, pl. ix, f. 7–9; pl. x, f. 1, 2; pl. xiii, f, 1–3; pl. xix, f. 1; pl. xx, f. 6, 1889.

Potomac formation: Fredericksburg, Brooke Station, and Potomac Run, Virginia.

Cladophlebis denticulata Font. Potomac Fl., p. 71, pl. iv, f. 2; pl. vii, f. 7, 1889.

Potomac formation: Fredericksburg and Potomac Run, Virginia.

Cladophlebis distans Font. Potomac Fl., p. 77, pl. xiii, f. 4, 5, 1889.

Potomac Fl.: Near Dutch Gap Canal, Virginia.

Kootanie: Great Falls, Montana.

Cladophlebis Dunkeri (Schimp.) Seward. Cat. Mesoz. Pl. Brit. Mus. Wealden Fl., pt. 1, p. 100, 1894.

Pecopteris Dunkeri Schimp. Pal. Vég., vol. i, p. 539, 1869.

Aspidium Dunkeri (Schimp.) Font. Potomac Fl., p. 101, pl. xxii, f. 9; xxv, f. 11, 12; xxvi, f. 2, 8, 9, 18; liv, f. 3, 9, 1889.

Potomac formation: Telegraph Station, Dutch Gap Canal, and Fredericksburg, Virginia.

Knoxville beds: Tehama County, California.

Cladophlebis falcata Font. Potomac Fl., p. 72, pl. iv, f. 8; pl. v, f. 1–6; vi, f. 7; pl. vii, f. 1, 2, 1889.

Potomac formation: Fredericksburg, Virginia.

Kootanie: Anthracite, British Columbia.

Cladophlebis heterophylla Font. Proc. U. S. Nat. Mus., vol. xv, p. 493, pl. lxxxiv, f. 2, 1892.

Kootanie: Great Falls, Montana.

Cladophlebis inæquiloba Font. Potomac Fl., p. 80, pl. xxv, f. 8, 1889.

Potomac formation: Fredericksburg, Virginia.

Cladophlebis inclinata Font. Potomac Fl., p. 76, pl. x, f. 3, 4; pl. xx, f. 8, 1889.

Potomac formation: Telegraph station, Virginia.

Knoxville beds: Tehama County, California.

Cladophlebis latifolia Font. Potomac Fl., p. 69, pl. iii, f. 1; pl. vi, f. 4, 1889.

Potomac formation: Baltimore, Maryland.

Cladophlebis oblongifolia Font. Potomac Fl., p. 74, pl. vii, f. 3–5, 1889.

Potomac formation: Fredericksburg and Dutch Gap Canal, Virginia.

Cladophlebis pachyphylla Font. Potomac Fl., p. 80, pl. xxv, f. 9, 1889.

Potomac formation: Fredericksburg, Virginia.

Cladophlebis parva Font. Potomac Fl., p. 73, pl. iv, f. 7; pl. vi, f. 1–3, 1889.

Potomac formation: Fredericksburg, Virginia.

Kootanie: Great Falls, Montana.

Cladophlebis petiolata Font. Potomac Fl., p. 80, pl. xxii, f. 8, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

Cladophlebis rotundata Font. Potomac Fl., p. 78, pl. xx, f. 9, 10, 1889.
Potomac formation: Fredericksburg, Virginia.

Cladophlebis sphenopteroides Font. Potomac Fl., p. 79, pl. xxi, f. 4, 1889.
Fishing hut above Dutch Gap Canal, Virginia.

Cladophlebis virginiensis Font. Potomac Fl., p. 70, pl. iii, f. 3–8; pl. iv, f. 1, 3–6, 1889.
Potomac formation: Fredericksburg, Virginia.

Cladophlebis sp.? Font. Potomac Fl., p. 76, pl. x, f. 5, 8; pl. xx, f. 7, 1889.
Potomac formation: Fredericksburg and Potomac Run, Virginia.

Cladophlebis sp., Font. Potomac Fl., p. 77, pl. xv, f. 6; pl. xix, f. 3, 1889.
Potomac formation: Potomac Run, and near Brooke Station, Virginia.

Cladophlebis sp., Font. Potomac Fl., p. 78, pl. xix, f. 2, 1889.
Potomac formation: Telegraph station, Virginia.

Cladophlebis sp., Font. Potomac Fl., p. 81, pl. xxvi, f. 15.
Potomac formation: Fredericksburg, Virginia.

Cladophlebis sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv., p. 85, 1892.
Kootanie: Anthracite, British Columbia.

Clathropodium mirabile (Lx.) Ward = Cycadeoidea mirabilis.

CLETHRA Gronovius ex Linnæus. Syst., ed. i, 1735.

Clethra alnifolia L. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Miocene?: Bridgeton, New Jersey.

COCCOLOBA Linnæus. Syst., ed. x, p. 1007, 1759.

Cocoloba lævigata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 387, 1872 [1873]; Tert. Fl., p. 208, pl. xxxv, f. 7, 1878.
Laramie group?: Carbon, Wyoming.

Cocculus De Candolle. Syst., Veg. V, i, p. 515 = Cebatha.

Cocculus Haydenianus Ward = Cebatha Haydeniana.

COLUTEA (Tournefort) Linnæus. Syst., ed. i, 1735.

Colutea Boweniana Lx. Cret. and Tert. Fl., p. 255, pl. lvii, f. 4, 1883.
Miocene?: Bowen claim, California.

Colutea primordialis Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 99, pl. xxvii, f. 7–11; lxiii, f. 78, 1882; Lx., Fl. Dak. Gr., p. 148, pl. xiii, f. 8, 9, 1892; Newby., Fl. Amboy Clays, p. 97, pl. xix, f. 4, 5, 1895 [1896].
Dakota group: Kansas.
Amboy clay: Woodbridge, New Jersey.
Cretaceous: Eatons Neck, Long Island.

COMPTONIA Banks. Gærtn. Fr. and Sem., vol. ii, p. 58, pl. xc, 1791.

Comptonia columbiana Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 81, f. (in text) 10, 1890.
Miocene?: North Similkamen and Kamloops, British Columbia.

Comptonia cuspidata Lx. = Myrica cuspidata.

Comptonia premissa Lx. = Myrica premissa.

CONE of Pinus? sp., Font. Potomac Fl., p. 272, pl. clxx, f. 4, 1889.
Potomac formation: Baltimore, Maryland.

CONOSPERMITES Ettingshausen. Sitzb. Wien. Akad., vol. lv, abt. i, p. 254, 1867.

Conospermites ellipticus Font. Potomac Fl., p. 279, pl. cxxxviii, f. 14, 1889.
Potomac formation: Near Potomac Run, Virginia.

Cordia? tiliæfolia Al. Br. = Ficus tiliæfolia.

CORNOPHYLLUM Newberry. Fl. Amboy Clays, p. 119, 1895 [1896].

Cornophyllum vetustum Newby. Fl. Amboy Clays, p. 119, pl. xix, f. 10, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

CORNUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Cornus acuminata Newby. = Cornus Newberryi.

Cornus Emmonsii Ward = Cornus impressa.

Cornus ferox Ung. Gen. et Sp. Pl. Foss., p. 441, 1850; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 21, 1888.
Eocene?: Cherry Creek, Oregon.

?**Cornus Fosteri** Ward. Bull. U. S. Geol. Surv., no. 37, p. 54, pl. xxv, f. 5, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Cornus Holmesii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 402, 1873 [1874]. [Not afterwards recognized.]
Laramie group?: Coal Creek, Colorado.

Cornus hyperborea Herr. Fl. Foss. Arct., vol. ii, abt. iv, p. 476, pl. l, f. 3, 4, 1869; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 29, pl. xv, f. 3, 1888.
Eocene?: Lassen County, California.
Denver beds: Mount Bross, Middle Park; North Denver, Colorado.
Laramie group? (upper beds): Point of Rocks, Wyoming.

Cornus impressa Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 408, 1873 [1874]; Tert. Fl., p. 243, pl. xlii, f. 3, 1878.
Cornus Emmonsii Ward. Bull. U. S. Geol. Surv., no. 37, p. 55, pl. xxvi, f. 2, 3, 1887.

Cornus incompletus Lx. Am. Jour. Sci., vol. xlv, p. 206, 1868. [Not afterwards referred to by its author.]
Laramie group: Marshalls, Colorado.

Cornus Kelloggii Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 23, pl. vi, f. 3, 1878.
Miocene: Chalk Bluffs, California.

Cornus Newberryi Hollick. nom. nov. MSS.

Cornus acuminata * Newby. Later Extinct Floras, p. 71, 1868; Ill., pl. xx, f. 2–4, 1878.

[* Cornus acuminata Newby. 1868. Preoccupied by C. acuminata O. Weber, Paleontogr., ii, p. 192. 1852.]

Cornus obesus Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 62, pl. ix, f. 30, 1893 [1894].

Upper Cretaceous: Vancouver Colliery, Vancouver Island.

Cornus orbifera Heer=Cornus suborbifera.

Cornus ovalis Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 23, pl. vi, f. 1, 2, 1878.

Miocene: Table Mountain, California.

Cornus platyphylloides Lx. Fl. Dak. Gr., p. 126, pl. lxiv, f. 15, 1892.

Dakota group: Kansas.

Cornus præcox Lx. Fl. Dak. Gr., p. 125, pl. xxiii, f. 5, 1892.

Dakota group: Kansas.

Cornus rhamnifolia O. Web. Paleontogr., vol. ii, p. 192, pl. iv, f. 8, 1852; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 9, 1871 [1872]; Tert. Fl., p. 244, pl. lxii, f. 6, 1878.

Laramie group: Bozeman coal field, Montana.

Montana formation: Point of Rocks, Wyoming.

Cornus Studeri ? Heer. Fl. Tert. Helv., vol. iii, p. 27, pl. cv, f. 18–21, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 293, 1871 [1872]; Tert. Fl., p. 244, pl. xlii, f. 4, 5, 1878.

Denver beds: Golden, Colorado.

Montana formation: Point of Rocks, Wyoming.

Cornus suborbifera Lx. Tert. Fl., p. 243, pl. xlii, f. 2, 1878.

Cornus orbifera Heer, Lx. Ann. Rept., op. cit., p. 402, 1873 [1874].

Eocene?: Cook Inlet, Alaska.

Laramie group: Golden, Colorado.

Cornus sp., Penhallow. Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 70, 1896.

Pleistocene: Greenville, New Jersey.

CORYLUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Corylus americana Walt. Flora Caroliniana, p. 236, 1788; Newby., Later Extinct Floras, p. 59, 1868.

Fort Union group: Seven-Mile Creek, Montana; Fort Union, Dakota.

Canadian Upper Laramie: Porcupine Creek.

Corylus Fosteri Ward. Bull. U. S. Geol. Surv., no. 37, p. 29, pl. xiii, f. 5, 6, 1887.

Fort Union group: Clear Creek, Montana.

Corylus grandifolia Newby. Later Extinct Floras, p. 59, 1868.

Fort Union group: Fort Union, Dakota.

Corylus MacQuarrii (Forbes) Heer. Urwelt d. Schweiz, p. 321, 1865.

Alnites? M'Quarrii Forbes. Quat. Journ. Geol. Soc., vol. vii, p. 103, pl. iv, f. 3, 1851.

Eocene?: Alaska, Mackenzie River.
Fort Union: Montana; Porcupine Creek, British Columbia.
Laramie group?: Carbon, Wyoming.

Corylus MacQuarrii macrophylla Heer. Fl. Foss. Arct., vol. i, p. 105, 1868; vol. ii, abt. ii (Fl. Foss. Alask.), p. 30, pl. iv, f. 6, 7, 1869.
Eocene?: Alaska.

Corylus orbiculata Newby. Later Extinct Floras, p. 58, 1868.
Fort Union group: Fort Union, Dakota.

Corylus rostrata Ait. Hort. Kew., vol. iii, p. 364, 1789; Newby., Later Extinct Floras, p. 60, 1868.
Fort Union group: Seven-Mile Creek, Montana; Fort Union, Dakota.
Canadian Upper Laramie: Porcupine Creek.

CRATÆGUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Cratægus acerifolia Lx. Cret. and Tert. Fl., p. 198, pl. xxxvi, f. 10, 1883.
Green River group: Florissant, Colorado.

Cratægus aceroides Lx. Fl. Dak. Gr., p. 143, pl. liv, f. 8; pl. lv, f. 1, 1892.
Dakota group: Kansas.

Cratægus ? æquidentata Lx. Tert. Fl., p. 297, pl. lviii, f. 4, 4*a*, 1878.
Laramie group?: Carbon, Wyoming.

Cratægus antiqua Heer. Fl. Foss. Arct., vol. i, p. 125, pl. l, f. 1, 2, 1868; Lx., Bull. Mus. Comp. Zoöl., vol. xvi, p. 57, 1888.
Denver group: Golden, Colorado.

Cratægus atavina Heer. Fl. Foss. Arct., vol. vii, p. 43, pl. lxiv, f. 11, 1883; Lx., Geol. and Nat. Hist. Surv. Minn., vol. iii, p. 20, pl. B, f. 8, 1893.
Dakota group: New Ulm, Minn.

Cratægus betulæfolia Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 56, 1888.
Denver group: Golden, Colorado.

Cratægus Engelhardti Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 56, 1888.
Denver group: Golden, Colorado.

Cratægus flavescens Newby. Proc. U. S. Nat. Mus., vol. v, p. 507, 1882 [1883].

Myrica diversifolia Lx. Cret. and Tert. Fl., p. 148, pl. xxv, f. 6–15, 1883.

Miocene?: Bridge Creek, John Day Valley, Oregon.
Green River group: Florissant, Colorado.

Cratægus Hoimesii Lx. Proc. U. S. Nat. Mus., vol. x, p. 43, pl. iii, f. 7–9, 1887.
Denver group: Silver Cliff, Colorado.

Cratægus Lacoei Lx. Fl. Dak. Gr., p. 143, pl. lxiv, f. 14. 1892.
Dakota group: Kansas.

Cratægus lawrenciana Lx. Fl. Dak. Gr., p. 142, pl. xxxviii, f. 1, 1892.
Dakota group: Kansas.

Cratægus Marcouiana Lx. Proc. U. S. Nat. Mus., vol. xi, p. 36, pl. xiv, f. 2; pl. xv, f. 1, 2, 1888.
Unknown: "Fossil Point, P. Y. Sheet."

Cratægus Marcouiana subintegrifolia Lx. Proc. U. S. Nat. Mus., vol. xi, p. 36, pl. xiv, f. 2, 1888.
Unknown: "Fossil Point, P. Y. Sheet."

Cratægus myricoides Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 56, 1888.
Denver group: Golden, Colorado.

Cratægus tenuinervis Lx. Fl. Dak. Gr., p. 142, pl. liv, f. 5–7, 1892.
Dakota group: Kansas.

CREDNERIA Zenker. Beiträge z. Naturgeschichte der Urwelt, p. 15, 1833.

? Credneria daturæfolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 97, pls. xlii, f. 4; xliii, xliv, xlv, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Credneria Leconteana Lx. = Protophyllum Leconteanum.

Credneria ? microphylla Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 397, 1875 [1876].
Dakota group: Kansas.

CTENIS, Lindley and Hutton. Foss Fl. Great Britain, vol. ii, p. 63, 1834.

Ctenis imbricata Font. Potomac Fl., p. 177, pl. cxxxviii, f. 10–12, 1889.
Potomac formation: Fredericksburg, Virginia.

CTENOPHYLLUM Schimper. Pal. Vég., vol. ii, p. 143, 1870.

Ctenophyllum latifolium Font. Potomac Fl., p. 175, pl. lxviii, f. 2, 3, 1889.
Potomac formation: Fredericksburg, Virginia.

CTENOPTERIS Brongniart, in litt. Saporta. Plantes Jurassiques, vol. i, p. 351, 1873.

Ctenopteris angustifolia Font. Potomac Fl., p. 159, pl. lxv, f. 2; lxvii, f. 4, 1889.
Potomac formation: Near Potomac Run, Virginia.

Ctenopteris insignis Font. Potomac Fl., p. 156, pl. lxi, f. 4, 5; lxii, f. 1; lxiii, f. 1, 2, 1889.
Potomac formation: Fredericksburg, and near Potomac Run, Virginia.

Ctenopteris integrifolia Font. Potomac Fl., p. 158, pl. lxii, f. 2; lxv, f. 3, 1889.
Potomac formation: Near Potomac Run, and Fredericksburg, Virginia.

Ctenopteris longifolia Font. Potomac Fl., p. 159, pl. lxvii, f. 5, 1889.
Potomac formation: Fredericksburg, Virginia.

Ctenopteris minor Font. Potomac Fl., p. 157, pl. lxvii, f. 3, 1889.
Potomac formation: Fredericksburg, Virginia.

Ctenopteris virginiensis Font. Potomac Fl., p. 157, pl. lxii, f. 4; lxv, f. 1; lxvi, f. 4, 1889.
Potomac formation: Fredericksburg, Virginia.

CUNNINGHAMITES Presl. In Sternb., Vers., vol. ii, p. 203, 1833.

Cunninghamites elegans (Corda) Endl. Synop. Conif., p. 305, 1847; Newby., Fl. Amboy Clays, p. 48, pl. v, f. 1–7, 1895 [1896].
Amboy clay: Keyport, New Jersey.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Cunninghamites squamosus Heer. Kreide Fl. v. Quedlinburg, p. 9, pl. i, f. 5–7, 1872; Hollick, Trans. N. Y. Acad. Sci., vol. xvi, p. 129, pl. xi, f. 3, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

CUPRESSINOXYLON Göppert. Monogr. d. foss. Conif., p. 196, 1850.

Cupressinoxylon arkansanum Kn. Ann. Rept. Geol. Surv. of Ark. for 1889, vol. ii, p. 253, pl. ix, f. 1, 2, 1889.
Tertiary [Orange Sand]: Near Wittsburg, Cross County, Arkansas.

Cupressinoxylon Calli Kn. Ann. Rept. Geol. Surv. of Ark. for 1889, vol. ii, p. 254, pl. ix, f. 3–7, 1889.
Tertiary: 5½ miles northwest of Gainesville, Green County, Arkansas.

Cupressinoxylon? Bibbinsi Kn. Science, new ser., vol. iii, no. 68, p. 584, f. (in text) 1–4, 1896.
Upper Potomac formation: Cape Sable, Maryland.

Cupressinoxylon columbianum Kn. Bull. U. S. Geol. Surv., no. 56, p. 49, pl. iv, f. 5; pl. v, f. 3, 4; pl. vi, f. 1–5; pl. vii, f. 1, 1888.
Potomac formation: Dutch Gap Canal, James River, Virginia.

Cupressinoxylon dubium Cramer. In Heer's, Fl. Foss. Arct., vol i, p. 173, pl. xxxiv, f. 3; xxxviii, f. 1–6, 1868.
———: Banks Land.

Cupressinoxylon elongatum Kn. Proc. U. S. Nat. Mus., vol. xi, p. 7, pl. iii, f. 1–4, 1888.
Fort Union group: Near Glendive, Montana.

Cupressinoxylon eutreton Felix. Zeitschr. d. Deutschen geol. Gesell. Jahr. 1896, p. 255, 1896.
Eocene: Yanceys, Yellowstone National Park.

Cupressinoxylon Glasgowi Kn. Proc. U. S. Nat. Mus., vol. xi, p. 6, pl. ii, f. 1–5, 1888.
Cretaceous?: Emmet County, Iowa.

Cupressinoxylon McGeei Kn. Bull. U. S. Geol. Surv., no. 56, p. 46, pl. ii, f. 5; pl. iii, f. 1–5, 1888.
Potomac formation: Washington, District of Columbia.

Cupressinoxylon polyommatum Cramer. In Heer's Fl. Foss. Arct., vol. i, p. 172, pl. xxxiv, f. 2*a*, *b*; xxxv, f. 2, 3; xxxvii, 1868.
———: Banks Land.

Cupressinoxylon pulchellum Kn. Bull. U. S. Geol. Surv., no. 56, p. 45, pl. ii, f. 1–4, 1889.
Potomac formation: Spring Hill, Appomattox River, Virginia.

Cupressinoxylon pulchrum Cramer. In Heer's Fl. Foss. Arct., vol. i, p. 171, pl. xxxiv, f. 1; xxxvi, f. 6–8, 1868.
———: Banks Land.

Cupressinoxylon taxodioides Conwentz. Schriften d. Naturf. Gesell. Danzig, vol. iv, p. 124, 1878; Neues Jahrb. f. 1878, p. 812, pl. xiii, xiv, 1878.
Tertiary: Calistoga, California.

Cupressinoxylon Wardi Kn. Bull. U. S. Geol. Surv., no. 56, p. 48, pl. iv, f. 1–4; pl. v, f. 1, 2, 1888.
Potomac formation: Near Montello, District of Columbia; Neabsco Creek, Virginia.

Cupressinoxylon sp., Kn. In Turner, Bull. Geol. Soc. Am., vol. ii, p. 394, 1891.
Knoxville beds: Eagle Point, California.

Cupressoxylon sp., Dn. Geol. Surv. Canada, Rept. of Progress for 1872–73, Appen. i, p. 67, 1873.
Lower Cretaceous: British Columbia.

Cupressoxylon sp. (a), Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, pl. xv, f. 3, 1875.
Lignitic tertiary: "Forty-ninth parallel."

Cupressoxylon sp. (b), Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, 1875.
Lignitic tertiary: "Forty-ninth parallel."

Cupressoxylon sp. (c), Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, pl. xv, f. 4, 1875.
Lignitic tertiary: "Forty-ninth parallel."

Cupressoxylon sp. (d), Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, 1875.
Lignitic tertiary: "Forty-ninth parallel."

Cupressoxylon sp. (e), Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, pl. xv, f. 5, 1875.
Lignitic tertiary: "Forty-ninth parallel."

Cupressoxylon sp. (f), Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, 1875.
Lignitic tertiary: "Forty-ninth parallel."

Cupressites Cookii Newby. Later Extinct Floras, p. 9, 1868; Fl. Amboy Clays, p. 61, 1895 [1896]. Nomen nudum.
Amboy clay: New Jersey.

Cupressus thyoides L. = Chamæcyparis thyoides.

CYATHEITES Göppert. Syst. Fil. Foss., p. 319, 1836.

Cyatheites? nebraskana (Heer) n. comb.

Pecopteris nebraskana Heer. Saporta, Fl. Foss. d. Sézanne, p. 332, f. (in text) 8, 1868; Lx., Cret. Fl., p. 46, pl. xxx, f. 12*b*, 1874.

Dakota group: Kansas.

CYCADEOIDEA Buckland. Proc. Geol. Soc. London, vol. i, p. 80, 1827.

Cycadeoidea Bibbinsi Ward. Proc. Biol. Soc. Wash., vol. xi, p. 15, 1897.

Potomac formation: Maryland.

Cycadeoidea dacotensis (McBride) Ward. Proc. Biol. Soc. Wash., vol. ix, p. 86, 1894.

Bennettites dacotensis McBride. Am. Geol., vol. xii, p. 249, pl. xi, f. 1, 2, 1893; Bull. Lab. Nat. Hist. State Univ. of Iowa, vol. ii, p. 391, pl. xii, f. 1, 2, 1893.

Lower Cretaceous: Minnekahta Station, South Dakota.

Cycadeoidea Fontaineana Ward. Proc. Biol. Soc. Wash., vol. xi, p. 13, 1897.

Potomac formation: Maryland.

Cycadeoidea Goucheriana Ward. Proc. Biol. Soc. Wash., vol. xi, p. 14, 1897.

Potomac formation: Maryland.

Cycadeoidea Jenneyana Ward. Proc. Biol. Soc. Wash., vol. ix, p. 87, 1894.

Lower Cretaceous: Near Rapid City, South Dakota.

Cycadeoidea marylandica (Font.) Cap. and Solms. Mem. Real. Accad. Sci. Ist. Bologna, ser. v, tom. ii, p. 179, 180, 186, 1892; Ward, Proc. Biol. Soc. Wash., vol. ix, p. 86, 1894.

Cycas sp., Tyson. First Rept. State Agric Chem. Md., p. 42, 1860.
Bennettites sp., Car. Trans. Linn. Soc. Lond., vol. xxvi, p. 708, 1870.
Cycadeoidea sp., Font. Am. Journ. Sci., vol. xvii, p. 157, 1879.
Tysonia marylandica Font. Potomac Fl., p. 193, pl. clxxiv–clxxx, 1889.

Potomac formation: Maryland.

Cycadeoidea McGeeana Ward. Proc. Biol. Soc. Wash., vol. xi, p. 12, 1897.

Potomac formation: Maryland.

Cycadeoidea mirabilis (Lx.) Ward. Proc. Biol. Soc. Wash., vol. ix, p. 86, 1894.

Zamiostrobus? mirabilis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, 2d ser., no. 5, p. 383, 1875 [1876]; Tert. Fl. p. 70, pl. xliii, f. 1, 1878.
Nelumbium James. Science, vol. iii, p. 434, 1884.
Clathropodium mirabile (Lx.) Ward. Science, vol. iii, p. 532, 1884.
Cycadeoidea Zamiostrobus Solms. Mem. Real. Accad. Sci. Ist. Bologna, ser. v, tom. ii, p. 210, 1892.

Unknown: Golden, Colorado.

Cycadeoidea munita Cragin. Bull. Washburn College Lab. Nat. Hist., Topeka, Kans., vol. ii, p. 65, 1889.

Lower Cretaceous: Belvidere, Kansas.

Cycadeoidea Tysoniana Ward. Proc. Biol. Soc. Wash., vol. xi, p. 11, 1897.
Potomac formation: Maryland.

Cycadeoidea Uhleri Ward. Proc. Biol. Soc. Wash., vol. xi, p. 14, 1897.
Potomac formation: Maryland.

Cycadeoidea Zamiostrobus Solms=Cycadeoidea mirabilis.

Cycadeoidea sp., Font.=Cycadeoidea marylandica.

CYCADEOSPERMUM Saporta. Pl. Jurass., vol. ii, p. 235, 1875.

Cycadeospermum acutum Font. Potomac Fl., p. 270, pl. cxxxv, f. 12, 1889.
Potomac formation: Potomac Run, Virginia.

Cycadesopermum angustum Font. Potomac Fl., p. 271, pl. cxxxv, f. 20, 1889.
Potomac formation: Near Potomac Run, Virginia.

Cycadeospermum (Dioonites) columbianus Dn.=Dioonites columbianus.

Cycadeospermum columnare Lx. Fl. Dak. Gr., p. 31, pl. xliv, f. 7, 8, 1891.
Dakota group: Kansas.

Cycadeospermum ellipticum Font. Potomac Fl., p. 271, pl. cxxxv, f. 19, 1889.
Potomac formation: Near Dutch Gap Canal and Fredericksburg, Virginia.

Cycadeospermum lineatum Lx. Fl. Dak. Gr., p. 30, pl. i, f. 14, 1891.
Dakota group: Kansas.

Cycadeospermum obovatum Font. Potomac Fl., p. 270, pl. cxxxv, f. 13, 1889.
Potomac formation: Near Potomac Run, Virginia.

Cycadeospermum rotundatum Font. Potomac Fl., p. 271, pl. cxxxvi, f. 12, 1889.
Potomac formation: Kankeys, Virginia.
Trinity division, Glenrose, Texas.

Cycadeospermum spatulatum Font. Potomac Fl., p. 271, pl. cxxxv, f. 11, 21, 1889.
Potomac formation: Near Potomac Run, Virginia.

CYCADINOCARPUS Schimper. Pal. Vég., vol. ii, p. 208, 1870.

Cycadinocarpus circularis Newby. Fl. Amboy Clays, p. 46, pl. xlvi, f. 1–4, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

CYCADITES Buckland. Geol. and Mineral., vol. i, p. 496, 1836.

Cycadites pungens Lx. Fl. Dak. Gr., p. 30, pl. ii, f. 6, 1892.
Dakota Group: Kansas.

Cycadites unjiga Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 20, pl. i, f. 2, 2*a*, 1882 [1883].

——— : Pine River Forks, Table Mountain, and Peace River, Northwest Territory.

Cycas sp., Tyson=Cycadeoidea marylandica.

CYPERACITES Schimper. Pal. Vég., vol. ii, p. 412, 1870.

[Cyperites Lindl. and Hutt. Foss. Fl. Gr. Brit., vol. i, p. 124, 1831-1833 = Lepidodendron. Cyperites Heer. Fl. Tert. Helv., vol. i, p. 75, 1855 = Cyperacites.]

Cyperacites angustior (Al. Br.) Schimp. Pal. Vég., vol. ii, p. 414, 1870.

Cyperites angustior Al. Br. In Stizenberger, Verstinerung, p. 75, 1851; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 403, 1872 [1873]. [Not afterwards mentioned by Lesquereux.]

——— ?: Elk Creek, Yellowstone National Park.

?**Cyperacites borealis** (Heer) n. comb.

Cyperites borealis? Heer. Fl. Foss. Arct., vol. i, p. 96, pl. xlv, f. 3, 1868; Lx., Proc. U. S. Nat. Mus., vol. x, p. 36, 1887.

Pliocene?: Applegarth Canyon.

Cyperacites canaliculatus (Heer) Schimp. Pal. Vég., vol. ii, p. 415, 1870.

Cyperites canaliculatus Heer. Fl. Tert. Helv., vol. i, p. 77, pl. xxviii, f. 5, 1855; Lx., Proc. U. S. Nat. Mus., vol. x, p. 36, 1887.

——— ?: Near Strahlenberg, Utah.

Cyperacites paucinervis (Heer) Schimp. Pal. Vég., vol. ii, p. 414, 1870.

Cyperites paucinervis Heer. Fl. Tert. Helv., vol. i, p. 79, pl. xxix, f. 4, 1855; Dn., Trans. Roy. Soc. Canada, 2d ser., vol. i, sec. iv, p. 144, 1895 [1896].

Eocene: Stanley Park, British Columbia.

Cyperacites Haydenii (Lx.) n. comb.

Cyperites Haydenii Lx. Cret. and Tert. Fl., p. 140, pl. xxiii, f. 1-3*a*, 1883.

Green River Group: Uinta County, formerly but erroneously called Randolph County, Wyoming.

Cyperacites? sp. (Dn.) n. comb.

Cyperites? sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 90, f. (in text) 31, 1890.

Eocene?: Similkameen Valley, British Columbia.

Cyperacites sp. (Dn.) n. comb.

Cyperites sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 91, f. (in text) 16, 1892.

Kootanie: Anthracite? British Columbia.

Cyperacites sp., Kn. Bull. Geol. Soc. Am., vol, viii, p. 145, 1897.

Fort Union group: Black Buttes, Wyoming.

Cyperites borealis Heer=Cyperacites borealis.

Cyperites canaliculatus Heer=Cyperacites canaliculatus.

Cyperites angustior Al. Br.=Cyperacites angustior.

Cyperites Deucalionis Heer. Fl. Tert. Helv., vol. i, p. 78, pl. xxix, f. 1; pl. xxvi, f. 13*b*; xxx, f. 3*h*, 1855; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 285, 1871 [1872]. [Not afterwards recognized by Lesquereux.]

Eocene?: Barrell Springs, Wyoming.

Cyperites Haydenii Lx. = Cyperacites Haydenii.

Cyperites paucinervis Heer = Cyperacites paucinervis.

Cyperites sp., Dn. = Cyperacites sp.

CYPERUS (Micheli) Linnæus. Syst., ed. i, 1735.

Cyperus ! Braunianus ? Heer. Fl. Tert. Helv., vol. i, p. 72, pl. xxii, f. 6; pl. xxvii, f. 4–7, 1855; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 285, 1871 [1872]. [Not afterwards mentioned by Lesquereux.]

Eocene?: Barrell Springs, Wyoming?

Cyperus Chavanensis "Heer" = Cyperus Chavannesi.

Cyperus Chavannesi Heer. Fl. Tert. Helv., vol. i, p. 72, pl. xxii, f. 7; xxviii, f. 1, 1855.

Cyperus Chavanensis Heer. Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 291, 1871 [1872]; Tert. Fl., p. 92, pl. ix, f. 1, 2, 1878.

Green River group: Green River Station, Wyoming.

Laramie group?: Evanston, Wyoming.

Cyperus sp., Kn. Am. Geol., vol. xviii, p. 371, 1896.

Glacial: Morgantown, West Virginia.

Cyperus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 133, 1897.

Laramie group: Lance Creek, Converse County, Wyoming.

CYTISUS Linnæus. Syst., ed. i, 1735.

Cytisus florissantianus Lx. Cret. and Tert. Fl., p. 200, pl. xxxix, f. 14, 1883.

Green River group: Florissant, Colorado.

Cytisus modestus Lx. Cret. and Tert. Fl., p. 200, pl. xxxix, f. 9–11, 1883.

Green River group: Florissant, Colorado.

CZEKANOWSKIA Heer. Fl. Foss. Arct., vol. iv, abt. ii, p. 70, 1876.

Czekanowskia capillaris Newby. Fl. Amboy Clays, p. 61, pl. ix, f. 14–16, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

DALBERGIA Linnæus, f. Suppl., p. 52, 1781.

Dalbergia apiculata Newby. Fl. Amboy Clays, p. 90, pl. xlii, f. 17–19, 1895 [1896.]

Amboy clay: Woodbridge, New Jersey.

Dalbergia cuneifolia Heer. Fl. Tert, Helv., vol. iii, p. 104, pl. cxxxiii, f. 20, 1859; Cret. and Tert. Fl., p. 200, pl. xxxiv, f. 6, 7, 1883.

Green River group: Florissant, Colorado.

Dalbergia hyperborea Héer. Fl. Foss. Arct., vol. vi, abt. ii, p. 102, pl. xxvi, f. 4*a*, 1882; Hollick, Trans. N. Y. Acad. Sci., vol. xi, p. 7, pl. iv, f. 7, 1892.
Cretaceous: Tottenville, Staten Island.

Dalbergia Rinkiana Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 102, pl. xxvi, f. 1–3, 1882; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 236, pl. vi, f. 4, 5, 1893.
Cretaceous: Brooklyn, New York; Lloyds Neck, Long Island.

DAMMARA Gærtner. Fruct., vol. ii, p. 100, 1791.

Dammara borealis Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 54, pl. xxxvii, f. 5, 1882; Newby., Fl. Amboy Clays, p. 46, pl. x, f. 8, 1895 [1896]; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 31, pl. i, f. 17, 1892.
Amboy clay: No location.
Cretaceous: Tottenville, Staten Island.

Dammara microlepis Heer, Newby. = Juniperus macilenta.

Dammara (?) cliffwoodensis Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 128, pl. xi, f. 5–8, 1897.
Clay marl (Upper cretaceous): Cliffwood, New Jersey.

DAMMARITES Presl. In Sternberg, Vers., vol. ii, p. 203, 1833.

Dammarites caudatus Lx. Fl. Dak. Gr., p. 32, pl. i, f. 9, 10, 1892.
Podozamites caudatus Lx. Cret. and Tert. Fl., p. 29, 1883.
Podozamites prælongus Lx. Cret. and Tert. Fl., p. 29, 1883.
Dakota group: Kansas.

Dammarites dubius Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 56, pl. vi, f. 8, 1893 [1894].
Upper Cretaceous: Nanaimo.

Dammarites emarginatus Lx. Fl. Dak. Gr., p. 33, pl. i, f. 11, 1892.
Podozamites emarginatus Lx. Cret. and Tert. Fl., p. 29, 1883.
Dakota group: Kansas.

DAPHNOGENE Unger. Synop. Pl. Foss., p. 227, 1845.

Daphnogene anglica ? Heer. Fl. Tert. Helv., vol. iii, p. 315, 1859; Lx., Ann. Rept., op. cit., p. 401, 1873 [1874]; Tert. Fl., p. 222, pl. xxxvii, f. 9, 1878.
Denver group: Golden, Colorado.

Daphnogene cretacea Lx. = Cinnamomum Scheuchzeri.
Daphnogene elegans Wat.-Ward = Diospyros ficoidea.
Daphnogene Heerii Lx. = Cinnamomum Heerii.
Daphnogene lanceolata Ung. = Cinnamomum lanceolatum.

DAPHNOPHYLLUM Heer. Neue Denkschr. Schw. Ges., vol. xxiii, p. 17, 1869.

Daphnophyllum angustifolium Lx. Fl. Dak. Gr., p. 98, pl. xxxvi, f. 8, 1892.
Dakota group: Kansas.

Daphnophyllum dakotense Lx. Fl. Dak. Gr., p. 99, pl. li. f. 1–4; pl. lii, f. 1, 1892.

Dakota group: Kansas.

Daphnophyllum sp., Lx. Rept. on Clay in N. J., p. 29, 1878=?

Amboy clay: Sayreville, New Jersey.

DAVALLIA Smith. Mem. Act. Turin, vol. v, p. 414, 1791.

Davallia (Stenoloma) tenuifolia Sw. Dawson, Rept on Geol. and Res. in Vic. 49th Parallel, Appen. A, p. 329, 1875.

Canadian Upper Laramie: Porcupine Creek.

DAVALLITES Dawson. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 25, 1882 [1883].

Davallites Richardsoni Dn. Trans. Roy Soc. Canada, vol. i, sec. iv, p. 25, pl. v, f. 18–18*b*, 1882 [1883].

Upper Cretaceous: Protection Island.

DELESSERIA Lam. Ann. Mus., vol. xx, p. 122, 1813.

Delesseria fulva Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 376, 1872 [1873]; Tert. Fl., p. 39, pl. i, f. 10, 1878.

Laramie group: Golden, Colorado.

Delesseria incrassata Lx. = Caulerpites incrassatus.

Delesseria ligulata Lx.=Caulerpites ligulatus.

DEWALQUEA Saporta and Marion. Mém. cour. et des Sav. étrangers de l'Académie, vol. xxxvii, p. 55, 1874.

Dewalquea dakotensis Lx. Fl. Dak. Gr., p. 211, pl. lix, f. 5, 6, 1892.

Dakota group: Kansas.

Dewalquea grönlandica Heer? Fl. Foss. Arct., vol. vi, abt. ii, p. 87, pl. xxix, f. 18, 19; xliv, f. 11, 1882; Newby, Fl. Amboy Clays, p. 129, pl. xli, f. 2, 3, 12, 1895 [1896].

Amboy clay: New Jersey.

Dewalquea Haldemiana (Deb.) Sap. and Mar. Essai, p. 60, pl. 7, f. 1, 2, 1874; Lx., Proc. U. S. Nat. Mus., vol. x, p. 46, 1887; Hollick, Trans N. Y. Acad. Sci., vol. xii, p. 36, pl. ii, f. 10, 2*a*, 1892.

Cretaceous: Upper Kanab Valley, Utah; Staten Island.

Dewalquea insignis Hos. and v. d. Marck. Palæontogr., vol. xxvi, p. 172 [48 of reprint], pl. 32, 33, 34, 1880; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 36, pl. i, f. 9, 1892.

Cretaceous: Staten Island.

Dewalquea primordialis Lx. Geol. and Nat. Hist. Surv. Minn., vol. iii, p. 18, pl. A, f. 10, 1893.

Dakota group: New Ulm, Minnesota.

Dewalquea trifoliata Newby. Fl. Amboy Clays, p. 129, pl. xxii, f. 4–7, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

DICKSONIA Presl. Pterid., p. 135, 1836.

Dicksonia munda Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 11, pl. iii, f. 5, *5a*, 1885 [1886].
Mill Creek series: Mill Creek.

Dicksonia sp., Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 5, 1885 [1886].
Kootanie: Martin Creek, British Columbia.

DIOÖNITES. Miquel. Tijdschr. v. Wis- en Nat.-Wetens., vol. iv, p. 211 (7 of reprint), 1851.

Dioönites borealis Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 24, pl. iii, f. 37, 1882 [1883].
Lower Cretaceous?: Willow Creek, Northwest Territory.
Kootanie: Martin Creek and Canmore, British Columbia.

Dioönites Buchianus (Ett.) Born. Org. Reste d. Lettenkohlengr. Thüringens, p. 57, 1856; Font., Potomac Fl., p. 182, pl. lxviii, f. 1; lxix, f. 1, 3; lxx, f. 2, 3; lxxi, f. 1; lxxii, f. 1, 2; lxxiii, f. 1–3; lxxiv, f. 1–3, 1889.
Pterophyllum Buchianum Ett. Fl. d. Wealdenb., p. 21, 1852.
Potomac formation: James River, Trents Reach, Dutch Gap Canal, Kankeys, and near Telegraph Station, Virginia.
Trinity division: Glenrose, Texas.

Dioönites Buchianus angustifolius Font. Potomac Fl., p. 185, pl. lxvii, f. 6; lxviii, f. 4; lxxi, f. 2, 1889.
Potomac formation: Dutch Gap, Kankeys, and Occoquan, Virginia.
Trinity division: Glenrose, Texas.
Horsetown beds: Shasta County, California.

Dioönites Buchianus obtusifolius Font. Potomac Fl., p. 184, pl. clxviii, f. 3, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

Dioönites Buchianus rarinervis Font. Proc. U. S. Nat. Mus., vol. xvi, p. 264, pl. xxxvi, f. 3, 4, 1893.
Trinity division: Glenrose, Texas.
Knoxville beds: Tehama County, California.

Dioönites columbianus Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 91, 1892 [1893].
Cycadeospermum (Dioönites) columbianus Dn. Geol. Surv. Canada, Rept. of Progress for 1872–73, Appen. i, p. 69, pl. i, f. 1–12, 1873.
Lower Cretaceous: Skidegate Channel, Queen Charlotte Island.

Dioönites Dunkerianus (Göpp.) Miq. Tijdschr. v. Wis- en Nat.-Watens., vol. iv, p. 212, 1851; Font. Proc. U. S. Nat. Mus., vol. xvi, p. 265, pl. xxxvi, f. 12; xxxvii, f. 1, 1893.
Trinity division: Glenrose, Texas.
Horsetown beds: Shasta County, California.

DIOSCOREA Plumier ex Linnæus. Gen., ed. i, p. 306, 1737.

Dioscorea? cretacea Lx. Cret. Fl., p. 56, pl. xxviii, f. 10, 1874.
Dakota group: Western Kansas.

DIOSPYROS Linnæus. Gen., ed. i, p. 143, 1737.

Diospyros alaskana Schimp. Pal. Vég., vol. ii, p. 949, 1872.

Diospyros lancifolia* Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 293, 1871 [1872]; Heer, Neue Denkschr., vol. xxi, p. 8, pl. i, f. 10–12; pl. ii, f. 1–3, 1865.

[*Preoccupied.]

Eocene?: Alaska; Cherry Creek, Oregon; Bellingham Bay.

Laramie group?: Evanston, Wyoming.

Diospyros ambigua Lx. Cret. and Tert. Fl., p. 60; Fl. Dak. Gr., p. 110, 1892.

Diospyros anceps Lx. Cret. Fl., p. 89, pl. vi, f. 6, 1874.

Quercus anceps Lx. Am. Journ. Sci., vol. xlvi, p. 96, 1868. [*D. anceps* preoccupied by sp. of Heer.]

Dakota group: Nebraska.

Diospyros anceps Heer. Fl. Tert. Helv., vol. iii, p. 12, pl. cii, f. 15–18, 1859; Lx., Proc., U. S. Nat. Mus., vol. v, p. 448, 1882 [1883].

Eocene?: Cook Inlet, Alaska.

Diospyros anceps Lx.= Diospyros ambigua.

Diospyros apiculata Lx. Fl. Dak. Gr., p. 110, pl. xiv, f. 3, 1892; Hollick, Bull. Geol. Soc. Am., vol. vii, p. 13, 1895.

Dakota group: Kansas.

Cretaceous: Marthas Vineyard.

Diospyros brachysepala Al. Br. Neues Jahrb. f. Min. 1845, p. 170, 1845; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 394, 1872 [1873]; Tert. Fl., p. 232, pl. xl, f. 7–10; pl. xliii, f. 6, 1878.

Rhamnus inæqualis Lx. Ann. Rept., op. cit., p. 405, 1873 [1874]; Tert. Fl., p. 279, pl. lii, f. 16, 1878.

Laramie group: Golden, Sand Creek, Sedalia, Colorado; Black Buttes and Hodges Pass, Wyoming.

Fort Union group: Yellowstone River, Montana.

Green River group: Florissant, Colorado.

Montana formation?: Point of Rocks, Wyoming.

Diospyros? celastroides Lx. Fl. Dak. Gr., p. 113, pl. xx, f. 7, 1892.

Dakota group: Kansas.

Diospyros Copeana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 414, 1873 [1874]; Tert. Fl., p. 232, pl. xl, f. 11, 1878.

Green River group: Elko Station, Nevada.

Diospyros eminens Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 62, pl. x, f. 40, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver Island.

Diospyros? ficoidea Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 387, 1875 [1876]; Ann. Rept., op. cit., p. 314, 1874 [1876]; Tert. Fl., p. 231, pl. xl, f. 5, 6, 1878; Ward, Bull. U. S. Geol. Surv., no. 37, p. 105, pl. xlix, f. 3, 4, 1887.

Daphnogene elegans Wat. Ward, Bull. U. S. Geol. Surv., no. 37, p. 51, pl. xxv, f. 1, 1887.

Fort Union group: Clear Creek and Burns Ranch, Montana.

Laramie group: Black Buttes and Hodges Pass, Wyoming.

Diospyros lancifolia Lx.=Diospyros alaskana.

Diospyros nitida Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 22, pl. iii, f. 10, 1882 [1883].

———: Peace River, Northwest Territory.

?**Diospyros obtusata** Ward. Bull. U. S. Geol. Surv., no. 37, p. 105, pl. xlix, f. 5, 1887.

Fort Union group: Seven-Mile Creek, Montana.

Diospyros primæva Heer. Phyll. Crét. d. Nebr., p. 19, pl. i, f. 6, 7, 1866; Lx., Fl. Dak. Gr., p. 109, pl. xx, f. 1–3, 1892; Newby., Fl. Amboy Clays, p. 124, pl. xxx, f. 1–5, 1895 [1896].

Dakota group: Nebraska and Kansas.
Cretaceous: Glen Cove, Long Island.
Amboy clay: South Amboy, New Jersey.

Diospyros pseudoanceps Lx. Fl. Dak. Gr., p. 111, pl. xxii, f. 1, 1892; Geol. and Nat. Hist. Surv. Minn., vol. iii, p. 17, pl. B, f. 6, 1893.

Dakota group: Kansas; New Ulm, Minnesota.

Diospyros rotundifolia Lx. Cret. Fl., p. 89, pl. xxx, f. 1, 1874; Fl. Dak. Gr., p. 112, pl. xvii f. 8–11, 1892; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 53, pl. 179, f. 2, 1894.

Dakota group: Western Kansas.
Cretaceous: Glen Cove, Long Island.

Diospyros Steenstrupi? Heer. Fl. Foss. Arct., vol. vii, p. 32, pl. lxiv, f. 1, 1883; Lx., Fl. Dak. Gr., p. 111, pl. xvi, f. 9, 1892.

Dakota group: Kansas; Staten Island?

Diospyros stenosepala Heer. Fl. Foss. Alask., p. 35, pl. viii, f. 7, 8, 1869; Lx., Ann. Rept. U. S. Geol. and Geogr, Surv. Terr., p. 296, 1871 [1872].

Eocene?: Alaska; Snake River, Yellowstone National Park.

Diospyros vancouverensis Dn. Trans. Roy Soc. Canada, vol. i, sec. iv, p. 28, pl. viii, f. 32, 1882 [1883].

Upper Cretaceous: Nanaimo; Port McNeill, Vancouver Island.

Diospyros virginiana Turneri Lx. Proc. U. S. Nat. Mus., vol xi, p. 35, 1888.

Miocene: Contra Costa, California.

Diospyros Wodani Ung. Gen. et Sp. Pl. Foss., p. 435, 1850; Syll. Pl. Foss., pt. iii, p. 27, pl. ix, f. 10–12, 1859; Lx., Tert. Fl., p. 233, pl. lix, f. 13, 1878.

Calycites hexaphylla Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 402, 1872 [1873].

Laramie group?: Evanston, Wyoming.

Diospyros (calyx) Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 62, pl. x, f. 41, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver Island.

Diospyros sp., Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 330, 1875.

Lignitic Tertiary: Porcupine Creek.

Diplazium Muelleri? Heer, Lx.=Asplenium Crossii.

DISTICHIUM Bruchman Schimper and Gümbel. Bryol. Europ. Foss., p. 18–20, 1846.

Distichium capillaceum Bruch. and Schimp. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 62, 1896.
Pleistocene: Long Portage, Missinaibi River.

DOMBEYOPSIS Unger. Steiermärkische Zeitschr. Gratz, vol. ix, 1 heft, p. 47 (?) [24 of reprint], 1848; Gen. et Sp. Pl. Foss., p. 447, 1850.

Dombeyopsis æquifolia Göpp. Lx.=Ficus tiliæfolia.

Dombeyopsis grandifolia? Ung. Gen. et Sp. Pl. Foss., p. 447, 1850: Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 404, 1873 [1874]; Tert. Fl., p. 255, pl. xlvii, f. 6, 1878.
Denver group: Golden, Colorado.

Dombeyopsis obtusa Lx. Ann. Rep. U. S. Geol. and Geogr. Surv. Terr., p. 375, 1872 [1873]; Tert. Fl., p. 255, pl. xlvii, f. 4, 5, 1878.
Denver group: Golden, Colorado.
Laramie group: Golden, Coal Creek, Colorado.

Dombeyopsis obtusiloba Lx. var.? = Menispermites obtusiloba.

Dombeyopsis occidentalis Lx. = Ficus occidentalis.

Dombeyopsis platanoides Lx. Tert., Fl. p. 254, pl. xlvii, f. 1, 2, 1878.
Quercus platania var., rotundifolia Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 405, 1872 [1873].
Laramie group: Bozeman Coal Field, Montana.

Dombeyopsis tiliæfolia (Al. Br.) Ung. = Ficus tiliæfolia.

Dombeyopsis trivialis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 380, 1872 [1873]; Tert. Fl., p. 255, pl. xlvii, f. 3, 1878.
Laramie group: Golden, Colorado.

DROSERA Linnæus. Syst., ed. i, 1735.

Drosera rotundifolia L. Dn. Can. Nat., vol. iii, new ser., p. 70, 1868; Geol. Hist. Pl., p. 228, 1888.
Pleistocene: Greens Creek on Ottawa River, Canada.

DRUPA Lesquereux. Am. Journ. Sci., vol. xxxii, 2d ser., p. 360, 1861.

Drupa rhabdosperma Lx. Am. Journ. Sci., vol. xxxii, p. 360, 1861; Geol. Vt., vol. ii, p. 716, f. 150, 1861.
———: Brandon, Vermont.

Dryandroides lignitum (Ung.) Ett. Lx.=Myrica lignitum.

DRYOPHYLLUM Debey. Sur l. feuilles Querciformes d'Aix-la-Chapelle, p. 7, 1881.

Dryophyllum aquamarum Ward. Bull. U. S. Geol. Surv., no. 37, p. 26, pl. x, f. 2–4, 1887.
Laramie group: Black Buttes, Wyoming.

Dryophyllum basidentatum Ward=Quercus carbonensis.

Dryophyllum Bruneri Ward=Dryophyllum subfalcatum.

Dryophyllum (Quercus) crenatum Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 371, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p, 301, 1874 [1876]; Tert. Fl., p. 162, pl. lxii, f. 10, 11, 1878.
Montana formation: Point of Rocks, Wyoming.

Dryophyllum elongatum Dn.=Quercus occidentalis.

Dryophyllum falcatum Ward. Bull. U. S. Geol. Surv., no. 37, p. 27, pl. xi, f. 1, 1887.

Laramie group: Hodges Pass, Wyoming.

Dryophyllum (Quercus) Holmesii Lx.=Quercus Holmesii.

Dryophyllum latifolium Lx.= Quercus latifolia.

Dryophyllum neillianum Dn.= Quercus occidentalis.

Dryophyllum occidentale Dn.= Quercus occidentalis.

Dryophyllum primordiale Lx.= Quercus primordialis.

Dryophyllum (Quercus) salicifolium Lx.= Quercus Holmesii.

Dryophyllum stanleyanum Dn. Trans. Roy. Soc. Canada, 2d ser., sec. iv, p. 147, pl. vii, f. 13, 1895–96.

Eocene: Stanley Park, Vancouver, British Columbia.

Dryophyllum subfalcatum Lx. Bull. U. S. Geol. and Geogr. Serv. Terr., vol. i, p. 379, 1875; Ann. Rept., p. 301, 1874 [1876]; Tert. Fl., p. 163, pl. lxiii, f. 10, 1878.

Quercus gracilis Newby. Proc. U. S. Nat. Mus., vol. v, p. 504, 1882 [1883]; Plates, pl. lxvii, f. 4 [ined].

Dryophyllum Bruneri Ward. Bull. U. S. Geol. Surv., no. 37, p. 27, pl. x., f. 5–8, 1887.

Montana formation: Point of Rocks, Wyoming.

Laramie group: Hodges Pass, Wyoming.

Dryophyllum sp., Dn.= Quercus occidentalis.

DRYOPTERIS Adanson. Fam. Pl., vol. ii, p. 20, 1763.

Dryopteris angustipinnata (Font.) n. comb.

Aspidium angustipinnatum Font. Potomac Fl., p. 98, pl. xvi, f. 1, 3, 8; xvii, f. 1; xix, f. 10, 1889.

Potomac formation: Trents Reach, Dutch Gap Canal, Freidericksburg, and near Potomac Run, Virginia.

Dryopteris angustipinnata montanense (Font.) n. comb.

Aspidium angustipinnatum montanense Font. Proc. U. S. Nat. Mus., vol. xv, p. 491, pl. lxxxiv, f. 1, 1*a*, 1892.

Kootanie: Great Falls, Montana.

Dryopteris arguta (Lx.) n. comb.

Lathræa arguta Lx. Am. Journ. Sci., vol. lxv, p. 207, 1868.

Aspidium Lakesii (Lx.) Kn. Proc. Biol. Soc. Wash., vol. vii; p. 154, 1892; Bull. U. S. Geol. Surv., no. 105, p. 45, pl. vi, f. 1–4, 1893.

Sphenopteris Lakesii Lx. Tert. Fl., p. 49, pl. ii, f. 1, 1*a*, 1878.

Sphenopteris eocenica Ett. Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 376, 1872 [1873].

Sphenopteris membranacea Lx. Ann. Rept., op. cit., p. 394, 1873 [1874]; Tert. Fl., p. 50, pl. ii, f. 2–3*a*, 1878.

Denver group: Golden, Colorado.

Dryopteris cystopteroides (Font.) n. comb.

Aspidium cystopteroides Font. Potomac Fl., p. 99, pl. xvi, f. 2, 1889.

Potomac formation: Fredericksburg, Virginia.

Dryopteris dentata (Font.) n. comb.

Aspidium dentatum Font. Potomac Fl., p. 102, pl. xxv, f. 6, 7, 14, 15, 1889.

Potomac formation: Dutch Gap Canal, near Potomac Run, near telegraph station, Virginia.

Dryopteris elliptica (Font.) n. comb.

Aspidium ellipticum Font. Potomac Fl., p. 95, pl. xiii, f. 9, 10, 1889.

Potomac formation: Near Potomac Run, near Brooke, Virginia.

Dryopteris fredericksburgense (Font.) n. comb.

Aspidium fredericksburgense Font. Potomac Fl., p. 94, pl. xi, f. 1–6; xii, f. 1–6; xvi, f. 9; xix, f. 6, 7, 1889.

Potomac formation: Fredericksburg and near Telegraph Station, Virginia.

Kootanie: Anthracite, British Columbia; Great Falls, Montana.

Dryopteris heterophylla (Font.) n. comb.

Aspidium heterophylla Font. Potomac Fl., p. 96, pl. xiv, f. 1–5; xv, f. 1–5, 1889.

Potomac formation: Fredericksburg, Virginia.

Knoxville beds: Tehama County, California.

Dryopteris idahoensis Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 721, pl. xcix, f. 1, 2, 1898.

Payette formation: Marsh, Idaho.

Dryopteris Kennerleyi (Newby.) n. comb.

Aspidium Kennerleyi Newby. Bost. Journ. Nat. Hist., vol. vii, p. 513, 1863.

Upper Cretaceous: Vancouver Island (Dn.).

Upper Cretaceous?: Newcastle coal, Vancouver Island.

Dryopteris macrocarpa (Font.) n. comb.

Aspidium macrocarpum Font. Potomac Fl., p. 103, pl. xvii, f. 2, 1889.

Potomac formation: Dutch Gap Canal, Virginia.

Dryopteris microcarpa (Font.) n. comb.

Aspidium microcarpum Font. Potomac Fl., p. 103, pl. lix, f. 2, 12; lx, f. 6, 7, 1889.

Potomac formation: Near Potomac Run, Virginia.

Dryopteris monocarpa (Font.) n. comb.

Aspidium monocarpum Font. Proc. U. S. Nat. Mus., vol. xv, p. 490, pl. lxxxiii, f. 4–6*a*; pl. lxxxiv, f. 3, 3*a*, 1892.

Kootanie: Great Falls, Montana.

Dryopteris montanese (Font.) n. comb.

Aspidium montanense Font. Proc. U. S. Nat. Mus., vol. xv, p. 490, pl. lxxxii, f. 1–3; pl. lxxxiii, f. 2–3*a*, 1892.

Kootanie: Great Falls, Montana.

Dryopteris oblongifolia (Font.) n. comb.

Aspidium oblongifolium Font. Potomac Fl., p. 100, pl. xxi, f. 5, 1889.

Potomac formation: Near Potomac Run, Virginia.

Dryopteris Oerstedi? (Heer) n. comb.

Aspidium Oerstedi? Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 30, pl. xxxiv, f. 3, 4, 1882; Font., Potomac Fl., p. 99, pl. xix, f. 4, 1889.

Potomac formation: Near Telegraph Station, Virginia.

Dryopteris parvifolia (Font.) n. comb.

Aspidium parvifolium Font. Potomac Fl., p. 100, pl. xxi, f. 6; xxiv, f. 8; xxv, f. 10; xxvi, f. 1, 14, 16, 17, 1889.

Potomac formation: Fredericksburg, Dutch Gap Canal, Virginia.

Dryopteris pinnatifida (Font.) n. comb.

Apsidium pinnatifidum Font. Potomac Fl., p. 101, pl. xxi, f. 15, 1889.

Potomac formation: Bank near Brooke, Virginia.

Dryopteris (Lastrea) polypodioides? (Ett.) n. comb.

Lastrea (Goniopteris) polypodioides? (Ett.) Lesquereux. Tert. Fl., p. 57, pl. iv, f. 11, 12, 1878.

Goniopteris polypodioides Ett. Lesquereux. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 394, 1873 [1874].

Laramie group: Sand Creek, Colorado.

Dryopteris virginica (Font.) n. comb.

Aspidium virginicum Font. Potomac Fl., p. 97, pl. xv, f. 7; xxi, f. 14.

Potomac formation: Near Potomac Run and near Brooke, Virginia.

Dryopteris sp.

Aspidium sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 140, 1897.

Laramie group?: North Fork Dutton Creek, Wyoming.

ECHITONIUM Unger. Syn. Pl. Foss., p. 230, 1845.

Echitonium Sophiæ O. Web. Palæontogr., vol. ii, p. 187, pl. xx, f. 17, 1852; Lx., Am. Journ. Sci., vol. xlv, f. 206, 1868; Proc. U. S. Nat. Mus., vol. x, p. 41, 1887.

Laramie group?: Marshalls, Colorado.

———?: White River, Dakota.

ELÆAGNUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Elæagnus inæqualis Lx. Am. Journ. Sci., vol. xxvii, p. 364, 1859; Geol. Tenn., p. 428, pl. K, f. 7, 1869.

Pleistocene?: Somerville, Fayette County, Tennessee.

ELÆODENDRON Jacques f. Nova Acta Helv., vol. i, p. 36, 1787.

Elæodendron helveticum Heer. Fl. Tert. Helv., vol. iii, p. 71, pl. cxxii, f. 5, 1859; Lx., Proc. U. S. Nat. Mus., vol. v, p. 449, 1882 [1883].

Eocene?: Unga Island, Alaska.

Elæodendron polymorphum Ward. Bull. U. S. Geol. Surv., no. 37, p. 84, pl. xxxviii, f. 1–7, 1887.

Fort Union group: Burns Ranch, Montana.

Elæodendron serrulatum Ward. Bull. U. S. Geol. Surv., no. 37, p. 83, pl. xxxvii, f. 3–5, 1887.

Fort Union group: Burns Ranch and Seven-Mile Creek, Montana.

Elæodendron speciosum Lx. Fl. Dak. Gr., p. 175, pl. xxxvi, f. 2, 3, 1892.

Dakota group: Kansas.

ELODEA Michaux. Fl. Bor. Am., vol. i, p. 20, 1803.

Elodea canadensis? Mx. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 325, 1890.

Pleistocene: Rolling River, Manitoba.

EMBOTHRITES Unger. Gen. et Sp. Pl. Foss., p. 428, 1850.

Embothrites ? daphneoides Lx. Cret. and Tert. Fl., p. 51, 1883.

Embothrium ? daphneoides Lx. Cret. Fl., p. 87, pl. xxx, f. 10, 1874.

Dakota group: Kansas.

Embothrium ? daphneoides Lx. = Embothrites ? daphneoides.

ENCEPHALARTOPSIS Fontaine. Potomac Fl., p. 174, 1889.

Encephalartopsis nervosa Font. Potomac Fl., p. 174, pl. lxx, f. 4; lxxi, f. 3, 4; lxxii, f. 3, 4, 1889.
Potomac formation: Fredericksburg, Virginia.

ENCEPHALARTOS Lehman. Pugill., vol. vi, p. 3, 1834.

Encephalartos cretaceus Lx. Fl. Dak. Gr., p. 29, pl. i, f. 12, 1891.
Dakota group: Kansas.

ENGELHARDTIA Leschen. In Blume, Bijdr., 528, 1825.

Engelhardtia oxyptera Sap. Études (Ann. d. Sci. Nat., 5th ser., Bot., vol. 4), p. 344, pl. xii, f. 2, 1865; Lx., Cret. and Tert. Fl., p. 192, 1883.
Green River group: Florissant, Colorado.

EQUISETUM (Tournefort) Linnæus. Gen. Pl., p. 322, 1737.

Equisetum arvense L. Knowlton, Am. Geol., vol. xviii, p. 371, 1896.
Glacial: Morgantown, West Virginia.

Equisetum globulosum Lx. Proc. U. S. Nat. Mus., vol. v, p. 444, 1882 [1883]; Cret. and Tert. Fl., p. 222, pl. xlviii, f. 3, 1883.
Eocene?: Alaska.
Fort Union group: Bad Lands, Dakota.

Equisetum Haydenii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 284, 1871 [1872]; Tert. Fl., p. 67, pl. vi, f. 2–4, 1878.
Green River group: Barrell Springs, Wyoming.
Denver group?: Carbon, Wyoming.

Equisetum Hornii Lx. Proc. U. S. Nat. Mus., vol. xi, p. 23, 1888.
Eocene?: Cherry Creek, Oregon.

Equisetum lævigatum Lx. Tert. Fl., p. 68, pl. vi, f. 6, 7, 1878.
Equisetum? lævigatum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 395, 1873 [1874].
Laramie group: Golden and Sand Creek, Colorado.

Equisetum Lesquereuxii nom. nov.
Equisetum limosum? L.* Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 299, 1871 [1872]; Tert. Fl., p. 69, pl. vi, f. 5, 1878. [*Not the living *E. limosum!*]
Miocene?: Yellowstone National Park.

Equisetum limosum L. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 327, 1890; Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 66, 71, 1896.
Pleistocene: Greens Creek and Besserer's Wharf, Ottawa River.

Equisetum limosum? L. Lx. = Equisetum Lesquereuxii.

Equisetum Lyelli Mantell. Geol. S. E. England 1833, p. 217, 1833; Font., Potomac Fl., p. 65, pl. i, f. 7; pl. ii, f. 4, 5, 1889; Dn., Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 83, f. 1, 1892 [1893].
Potomac formation: Fredricksburg and Dutch Gap Canal, Virginia.
Kootanie: Canada.

Equisetum marylandicum Font. Potomac Fl., p. 65, pl. ii, f. 10, 1889.
Potomac formation: Baltimore, Maryland.

Equisetum nodosum Lx. = Phragmites cretaceus.

Equisetum oregonense Newby. Proc. U. S. Nat. Mus., vol. v, p. 503, 1882 [1883].
Miocene?: Currant Creek, Oregon.

Equisetum Parlatorii (Heer) Schimp. Pal. Vég., vol. i, p. 261, 1869.
Physagenia Parlatorii Heer. Fl. Tert. Helv., vol. i, p. 109, pl. xlii, f. 2–17, 1885; Dn., Rept. Geol. and Res., near 49th Parallel, Appen. A, p. 329, pl. xvi, f. 3, 4, 1875.
———: Great Valley, Canada.

Equisetum robustum Newby. Bost. Journ. Nat. Hist., vol. vii, p. 513, 1863.
———: Bellingham Bay, Washington.

Equisetum scirpoides Mx. Dn., Can. Nat., vol. iii, new ser., p. 73, 1868; Geol. Hist. Pl., p. 230, 1888.
Pleistocene: Greens Creek, Ottawa River, Canada.

Equisetum similkamense Dn. Geol. Surv. Canada, Rept. of Progress 1877–78, p. 186, pl. B, 1878; Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 76, f. 1–1*d*, 1890.
Eocene?: Similkameen Valley, British Columbia.

Equisetum sylvaticum? L. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 327, 1890.
Pleistocene: Canada.

Equisetum texense Font. Proc. U. S. Nat. Mus., vol. xvi, p. 263, pl. xxxvi, f. 1, 1893.
Trinity division: Glenrose, Texas.
Knoxville beds: Tehama County, California.

Equisetum virginicum Font. Potomac Fl., p. 63, pl. i, f. 1–6, 8; pl. ii, f. 1–3, 6, 7, 9, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

Equisetum wyomingense Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 409, 1873 [1874]; Tert. Fl., p. 69, pl. vi, f. 8–11, 1878.
Green River group: Green River, Wyoming.

Equisetum sp., Dn. Rept. Geol. and Res. near 49th Parallel, Appen. A, p. 329, 1875.
Canadian Upper Laramie: Porcupine Creek.

Equisetum sp., Paisley. Can. Nat., 2d ser., vol. vii, p. 270, 1875.
Post pliocene: Bathurst, New Brunswick.

Equisetum, rootlets of, Lx. Rept. on Clays in N. J., p. 28, 1878.
Amboy clay: Washington, New Jersey.

Equisetum sp. Lx. Cret. and Tert. Fl., p. 239, pl. l, f. 8, 1883.
Miocene: Corral Hollow, California.

Equisetum sp., Lx. Cret. and Tert. Fl., p. 239, pl. 1, f. 7, 1883.
Miocene: Contra Costa, California.

Equisetum sp., Dn. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 22, pl. i, f. 2, 1886 [1887].
Canadian Upper Laramie: Great Valley, Canada.

Equisetum sp., Font. Potomac Fl., p. 66, pl. clxx, f. 8, 1889.
Potomac formation: Baltimore, Maryland.

Equisetum sp., Font. Potomac Fl., p. 65, pl. ii, f. 8, 1889.
Potomac formation: Fredericksburg, Virginia.

Equisetum sp., Penhallow. Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 71, 1896.
Pleistocene: Scarboro Heights, Ontario.

Equisetum sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 133, 1897.
Laramie group: Lance Creek, Converse County, Wyoming.

Equisetum sp., Kn. Eighteenth Ann. Rep. U. S. Geol. Surv., pt. iii, p. 722, 1898.
Payette formation: Idaho City, Idaho.

EREMOPHYLLUM Lesquereux. Cret. Fl., p. 107, 1878.

Eremophyllum fimbriatum Lx. Cret. Fl., p. 107, pl. viii, f. 1, 1874.
Ficus? fimbriatus Lx. Am. Journ. Sci., vol. xlvi, p. 96, 1868.
Dakota group: Decatur, Nebraska.

ERIOCAULON Linnæus. Gen., ed. ii, p. 35, 1742.

Eriocaulon? porosum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1873 [1874]; Tert. Fl., p. 106, pl. xvi, f. 2, *2a*, 1878.
Laramie group: Sand Creek and Murpheys, near Golden, Colorado.

EUCALYPTOPHYLLUM Fontaine. Potomac Fl., f. 325, 1889.

Eucalyptophyllum oblongifolium Font. Potomac Fl., p. 325, pl. clxii, f. 4, 1889.
Potomac formation: Near Brooke, Virginia.

EUCALYPTUS L'Héritier. Sert. Angl., p. 18, 1788.

Eucalyptus? americana Lx. Tert. Fl., p. 296, pl. lix, f. 11, 12, 1878.
Eucalyptus americanus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 7, 1871 [1872].
Green River group: Green River Station, Wyoming.

Eucalyptus ? angustifolia Newby. Fl. Amboy Clays, p. 111, pl. xxxii, f. 1, 6, 7, 1895 [1896].
Amboy clay: South Amboy, New Jersey.

Eucalyptus? attenuata Newby. Fl. Amboy Clays, p. 111, pl. xvi, f. 2, 3, 5, 1895 [1896].
Amboy clay: South Amboy, New Jersey.

Eucalyptus dakotensis Lx. Fl. Dak. Gr., p. 137, pl. xxxvii, f. 14–19, 1892.
Dakota group: Kansas.

Eucalyptus Geinitzi Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 93, pl. xix, f. 1*c*; lxv, f. 4–9; xlvi, f. 12 *c*, *d*, 13, 1882; Lx., Fl. Dak. Gr., p. 138, pl. xxxvii, f. 20, 1892; Newby., Fl. Amboy Clays, p. 110, pl. xxxii, f. 2, 12, 15, 16, 1895 [1896].

Myrtophyllum (Eucalyptus?) Geinitzi Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 116. pl. xxxii, f. 14–17; xxxiii, f. 6*b*, 1874.

Dakota group: Kansas.

Amboy clay: New Jersey.

Cretaceous: Staten Island; Glenn Cove, Long Island; Marthas Vineyard.

Eucalyptus Gouldii Ward. Bull. Torr. Bot. Club, vol. xxiv, p. 576, f. (in text) 1, 2, 1897.

Dakota group: Clark County, Kansas.

Eucalyptus Hæringiana? Ett. Abhandl. d. k. k. Geol. Reichsanstalt, vol. ii, pt. 3, p. 84, pl. xxxviii, f. 2–25, 1853; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 400, 1872 [1873]; Tert. Fl., p. 296, pl. lix, f. 10, 1878.

Laramie group: Black Buttes, Wyoming.

Eucalyptus? nervosa Newby. MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 56, pl. 174, f. 10, 1894. Newby. Fl. Amboy Clays, p. 112, pl. xxxii, f. 3–5, 8, 1895 [1896].

Cretaceous: Sea Cliff, Long Island.

Eucalyptus? parvifolia Newby. Fl. Amboy Clays, p. 112, pl. xxxii, f. 9, 10, 1895 [1896.]

Amboy clay: South Amboy, New Jersey.

EUGENIA Micheli ex Linnæus. Syst., ed. i., 1735.

Eugenia primæva Lx. Fl. Dak. Gr., p. 137, pl. liii, f. 5–9, 1892.

Dakota group: Kansas.

EUONYMUS Linnæus. Hort. Cliff, p. 39, 1737.

Euonymus flexifolius Lx. Cret. and Tert. Fl., p. 183, pl. xxxviii, f. 13, 1883.

Green River group: Uinta County, formerly but wrongfully called Randolph County, Wyoming.

Euonymus xantholithensis Ward. Bull. U. S. Geol. Surv., no. 37, p. 82, pl. xxxvii, f. 1, 2, 1887.

Fort Union group: Burns Ranch, Montana.

FAGOPHYLLUM Nathorst. Pal. Abhandl. v. Dames u. Kayser, vol. iv, heft 3, p. 5, 1888.

Fagophyllum nervosum Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 58, pl. vii, f. 16, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver.

Fagophyllum retosum Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 57, pl. vii, f. 15, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver.

FAGUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Fagus Antipofii Abich. Mém. Acad. Sci. St. Petersbourg, ser. vi, Sci. math. et physiq., vol. vii, p. (35 of reprint) 572, pl. viii, f. 2, 1858; Heer, Fl. Foss. Arct., vol. ii, abt. ii, p. 30, pl. v, f. 4*a*; vii, f. 4–8; viii, f. 1, 1869.
Eocene?: Port Graham, Alaska.
Miocene: Table Mountain, California.
Laramie group?: Point of Rocks, Wyoming.

Fagus castaneæfolia Ung. = Castanea castaneæfolia.

Fagus cretacea Newby. Later Extinct Floras, p. 23, 1868.
Dakota group: Kansas.

Fagus Deucalionis Ung. Syn. Pl. Foss., p. 218, 1845; Lx., Proc. U. S. Nat. Mus., vol. v, p. 446, 1882 [1883].
Eocene?: Cook Inlet, Alaska.

Fagus Deucalionis Ung. Lx., Ann. Rept., 1871, p. 292 = Unknown. [Not afterwards referred to by Lesquereux.]
Laramie group?: Evanston, Wyoming.

Fagus Feroniæ Ung. Syn. Pl. Foss., p. 219, 1845; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 413, 1873 [1874]; Tert. Fl., p. 146, pl. xix, f. 1–3, 1878.
Green River group: Elko Station, Nevada.
Eocene?: Port Graham, Alaska.

Fagus ferruginea Michx. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 363, 1859; Geol. Tenn., p. 427, pl. K, f. 11, 1869; Kn., Am. Geol., vol. xviii, p. 371, 1896.
Pleistocene?: Somerville, Fayette County, Tennessee.
Glacial: Morgantown, West Virginia.

Fagus Hitchcockii Lx. Am. Journ. Sci., vol. xxxii, p. 357, 1861; Geol. Vt., vol. ii, p. 714, f. 126, 127, 1861.
———: Brandon, Vermont.

Fagus macrophylla Ung. Denkschr. Wien. Akad., vol. vii, p. (19 of reprint) 175, pl. ii, f. 10, 1854; Heer, Fl. Foss. Arct., vol. ii, abt. ii, p. 31, pl. viii, f. 2, 1869.
Eocene?: Port Graham, Alaska.

Fagus orbiculata Lx. Fl. Dak. Gr., p. 51, pl. xlvii, f. 6, 1892.
Dakota group: Ellsworth County, Kansas.

Fagus polycladus Lx. Am. Journ. Sci., vol. xlvi, p. 95, 1868.
Dakota group: Decatur, Nebraska; Kansas.

Fagus proto-nucifera Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 21, pl. ii, f. 6, 6*a*, 1882 [1883].
———: Peace River, Northwest Territory.

Fagus pseudo-ferruginea Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 3, pl. ii, f. 14, 1878.
Miocene: Chalk Bluffs, California.

FEILDENIOPSIS Fontaine. Potomac Fl., p. 204, 1889.

Feildeniopsis crassinervis Font. Potomac Fl., p. 205, pl. lxxxvi, f. 5, 1889.
Potomac formation: Kankeys, Virginia.

FICOPHYLLUM Fontaine. Potomac Fl., p. 290, 1889.

Ficophyllum crassinerve Font. Potomac Fl., p. 291, pl. cxliv, f. 3; cxlv, f. 3; cxlvi, f. 1; cxlvii, f. 4; cxlviii, f. 1, 2, 4; clvii, f. 4; clxxiii, f. 10, 1889.
Potomac formation: Fredericksburg, near Dutch Gap Canal, Deep Bottom, Virginia.

Ficophyllum eucalyptoides Font. Potomac Fl., p. 294, pl. clxiv, f. 1, 2, 1889.
Potomac formation: Near Brooke, Virginia.

Ficophyllum serratum Font. Potomac Fl., p. 294, pl. cxlv, f. 2; cxix, f. 9, 1889.
Potomac formation: Fredericksburg, Virginia.

Ficophyllum tenuinerve Font. Potomac Fl., p. 292, pl. cxl, f. 3; cxli, f. 2; cxlx, f. 1, 4; cxlvii, f. 2; cxlix, f. 1, 3, 5; clvi, f. 1, 1889.
Potomac formation: Near Potomac Run and Fredericksburg, Virginia.

FICUS Tournefort ex Linnæus. Syst., ed. v, 1735.

Ficus aligera Lx. Fl. Dak. Gr., p. 84, pl. x, f. 3–6, 1892.
Dakota group: Cloud County, Kansas.

Ficus alkalina Lx. Cret. and Tert. Fl., p. 164, pl. xliv, f. 7–9, 1883.
Green River group: Alkali Station, Wyoming.

Ficus alaskana Newby. Proc. U. S. Nat. Mus., vol. v, p. 512, 1882 [1883].
Eocene?: Cook Inlet and Admiralty Inlet, Alaska.

Ficus Andræi Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 50, 1888.
Denver group: Golden, Colorado.

Ficus? angustata Lx. Cret. and Tert. Fl., p. 47, 1883.
Dakota group: Bluff Creek, Kansas.

Ficus appendiculata Heer. Fl. Tert. Helv., vol. ii, p. 67, pl. lxxxv, f. 12, 13, 1856; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 31, 1888.
Eocene?: Lassen County, California.

Ficus arenacea Lx., ex. p.=Ficus lanceolata.
Ficus arenacea Lx., ex. p.=Ficus uncata.
Ficus arenacea brevipetiolata Lx.=Ficus uncata.

Ficus artocarpoides Lx. Cret. and Tert. Fl., p. 227, pl. xlvii, f. 1–5, 1883.
Fort Union group: Bad Lands, Dakota.

Ficus asarifolia Ett. Denkschr. d. k. Akad. Wissensch., vol. xxvi, p. 156, 1867; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 366, 1875 [1876]; Ann. Rept., op. cit., p. 378, 1872 [1873]; Tert. Fl., p. 207, pl. lxi, f. 18–21, 1878.
Denver beds?: Golden, Colorado.
Laramie group: Black Buttes, Wyoming.
Montana formation: Point of Rocks.

Ficus asarifolia minor Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 367, 1875 [1876]; Tert. Fl., p. 208, 1878.
Montana formation: Point of Rocks, Wyoming.

Ficus asiminæfolia Lx. Cret. and Tert. Fl., p. 250, pl. lvi, f. 1–3, 1883.
Miocene?: Rock Corral, Placer County, California.

Ficus atavina Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 69, 1882; Lx., Proc. U. S. Nat. Mus., vol. x, p. 40, 1887.
———: Upper Kanab Valley, Utah.

Ficus auriculata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 379, 1872 [1873]; Tert. Fl., p. 206, pl. xxx, f. 4–6, 1878.
Ficus truncata ? Lx. [nec Heer, 1859]. Ann. Rept., op. cit., p. 400, 1873 [1874].
Ficus subtruncata Lx. Tert. Fl., p. 206, pl. xxx, f. 7–9, 1878.
Laramie group: Golden, Colorado.
Livingston beds: Bozeman coal field, Montana.

Ficus austiniana Lx. Geol. and Nat. Hist. Surv. Minn., vol. iii, p. 14, pl. A, f. 5, 1893.
Dakota group: Cottonwood River, Minnesota.

Ficus Beckwithii Lx. Cret. and Tert. Fl., p. 46, pl. xvi, f. 5; pl. xvii, f. 3, 4, 1883.
Dakota group: Morrison, Colorado.

Ficus Berthoudi Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 49, 1888.
Denver group: Golden, Colorado.

Ficus Berthoudi Lx. Fl. Dak. Gr., p. 78, 1892 = Ficus Lesquereuxii.

Ficus cinnamomoides Lx. Trans. Am. Phil. Soc., vol. xiii, p. 417, pl. xvii, f. 8, 1869.
Eolignitic: Mississippi.

Ficus Clintoni Lx. = Ficus planicostata Clintoni.

Ficus Condoni Newby. Proc. U. S. Nat. Mus., vol. v, p. 512, 1882 [1883].
Miocene?: Bridge Creek, Oregon.

Ficus contorta Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 60, pl. ix, f. 31, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island.

Ficus ? corylifolius Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 394, 1872 [1873]. [Not afterwards recognized by its author.]
Laramie group?: Black Buttes, Wyoming.

Ficus crassipes Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 70, pl. xvii, f. 9a; pl. xxiv, f. 1, 2, 1882; Lx., Fl. Dak. Gr., p. 79, pl. xiii, f. 3, 1892.

Proteoids crassipes Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 110, 1874.

Dakota group: Kansas.

Ficus Crossii Ward = Ficus uncata.

Ficus ? cuneatus Newby. Bost. Journ. Nat. Hist., vol. vii, p. 524, 1863.

Cretaceous ?: Orcas Island, Washington.

Ficus dalmatica Ett. Denkschr. d. Wien. Akad., vol. viii, p. 13, pl. vii, f. 11, 1855; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 367, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 303, 1874 [1876]; Tert. Fl., p. 199, pl. lxiii, f. 3–5, 1878.

Laramie group: Coal Creek, Colorado.

Montana formation: Point of Rocks, Wyoming.

Ficus deflexa Lx. Fl. Dak. Gr., p. 80, pl. iii, f. 13; pl. xvi, f. 3, 1892.

Dakota group: Kansas.

Ficus distorta Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 393, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 342, pl. v, f. 5, 1874 [1876].

Dakota group: Fort Harker, Kansas.

Ficus ? fimbriatus Lx. = Eremophyllum fimbriatum.

Ficus Fredericksburgensis Font. Potomac Fl., p. 295, pl. cxlviii, f. 3, 5, 1889.

Potomac formation: Fredericksburg, Virginia.

Ficus Gaudini Lx. = Ficus uncata.

Ficus glascoeana Lx. Cret. and Tert. Fl., p. 48, 1883; Fl. Dak. Gr., p. 76, pl. xiii, f. 1, 2, 1892.

Dakota group: Glascoe, Kansas.

Ficus goldiana Lx. = Ficus planicostata Clintoni.

Ficus? Halliana Lx. Cret. Fl., p. 68, pl. xxviii, f. 3, 9, 1874.

Dakota group: Minnesota.

Ficus Haydenii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 394; 1872 [1873]; Tert. Fl., p. 197, pl. xxx, f. 1, 1878.

Laramie group: Black Buttes, Wyoming.

Ficus inaequalis Lx. Fl. Dak. Gr., p. 82, pl. xlix, f. 6–8; pl. l, f. 3, 1892.

Dakota group: Kansas.

Ficus irregularis Lx. Bull. U. S. Geol. and Geogr, Surv. Terr., vol. i, p. 368, 1875 [1876]; Tert. Fl., p. 196, pl. xxxiv, f. 4–7; pl. lxiii, f. 9, 1878.

Ulmus ? irregularis Lx. Ann Rept. U. S. Geol. and Geogr. Surv. Terr. p. 378, 1872 [1873].

Denver group: Golden, Colorado.

Laramie group: Golden, Colorado; Black Buttes, Wyoming.

Montana formation: Point of Rocks, Wyoming.

Ficus Jynx Ung. Gen. et Sp. Pl. Foss., p. 413, 1850. Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. p. 414, 1873 [1874]; Tert. Fl., p. 193, pl. xxviii, f. 6, 1878.

Green River group: Elko Station, Nevada.

Ficus Krausiana Heer. Neue Denkschr. Schw. Ges., vol. xxiii, p. 15, pl. v. f. 3–6, 1869; Lx., Fl. Dak. Gr., p. 81, pl. l, f. 5, 1892; Hollick, Bull. Geol. Soc. Am., vol. vii, p. 13, 1895.

Dakota group: Kansas.

Cretaceous: Marthas Vineyard.

Ficus lanceolata Heer. Fl. Tert. Helv., vol. ii, p. 62, pl. lxxxi, f. 2–5, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 300, 1871 [1872]; Tert. Fl., p. 192, pl. xxviii, f. 1–5, 1878.

Ficus arenacea Lx., ex. p. Ann. Rept., loc. cit., p. 300; Tert. Fl., p. 195, pl. xxix, f. 1, 4, 1878.

Laramie group: Marshall's mine, Coal Creek, and near Mount Carbon, Colorado.

Ficus lanceolato-acuminata Ett. Denkschr. Wien. Akad., vol. xxxii (Foss. Fl. v. Sagor), p. 182, pl. vi, f. 3, 4, 1872; Lx., Fl. Dak. Gr., p. 85, pl. xiii, f. 4, 1892.

Dakota group: Kansas.

Ficus latifolia (Lx.) n. comb.

Ficus planicostata latifolia Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 393, 1872 [1873]; Tert. Fl., p. 202, pl. xxi, f. 9, 1878.

Laramie group: Golden and Marshalls, Colorado; Black Buttes, Wyoming.

Ficus laurophylla Lx. = Ficus reticulata.

Ficus laurophyllidia Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 60, pl. x, f. 37, 1893 [1894].

Upper Cretaceous: Wellington mine, Nanaimo.

Ficus Lesquereuxii nom. nov.

Ficus Berthoudi * Lx. Fl. Dak. Gr. p. 78, pl. xii, f. 3, 1892; Hollick, Bull. Geol. Soc. Am., vol. vii, p. 13, 1895. [*Name preoccupied by F. Berthoudi of Lesquereux, 1888.]

Dakota group: Kansas.

Cretaceous: Marthas Vineyard.

Ficus limpida Ward. Bull. U. S. Geol. Surv., no. 37, p. 42, pl. xxii, f. 3, 1887.

Fort Union group: Clear Creek, Montana.

Ficus macrophylla Lx. Fl. Dak. Gr., p. 76, pl. xi, f. 1, 1892.

Dakota group: Kansas.

Ficus magnoliæfolia Lx. Cret. and Tert. Fl., p. 47, pl. xvii, f. 5, 6, 1883.

Dakota group: Morrison, Colorado.

Upper Cretaceous: Vancouver Island.

Ficus maxima Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 21, pl. ii, f. 5, 1882 [1883].

——— : Coal Brook, Northwest Territory.

Ficus melanophylla Lx. Fl. Dak. Gr., p. 83, pl. l, f. 2, 1892.

Dakota group: Kansas.

Ficus membranacea Newby. Proc. U. S. Nat. Mus., vol. v., p. 512, 1882 [1883].

Eocene?: Cook Inlet, Alaska.

Ficus microphylla Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 18, pl. iv, f. 10, 11, 1878.
Miocene: Table Mountain and Shasta County, California.

Ficus Mudgei Lx. Fl. Dak. Gr., p. 83, pl. xii, f. 4, 1892.
Dakota group: Kansas.

Ficus multinervis Heer. Fl. Tert. Helv., vol. ii, p. 63, pl. lxxxi, f. 6–10, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr, p. 300, 1871 [1872]; Tert. Fl., p. 194, pl. xxviii, f, 7, 8, 1878.
Laramie group: Coal Creek, Colorado, etc.
——— ?: Graves County, Kentucky.

Ficus myricoides Hollick. In Newby., Fl. Amboy Clays, p. 71, pl. xxxii, f. 18; xli, f. 8, 9, 1895 [1896].
Amboy clay: No location.

Ficus (Protoficus) nervosa Newby. Proc. U. S. Nat. Mus., vol. v, p. 512, 1882 [1883].
Laramie group?: Evanston, Wyoming.

Ficus oblanceolata Lx. = Pistacia oblanceolata.

Ficus occidentalis Lx. Tert. Fl., p. 200, pl. xxxii, f. 4, 1878.
Dombeyopsis occidentalis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 380, 1872 [1873].
Denver group: Golden, Colorado.

Ficus? oregoniana Lx. Proc. U. S. Nat. Mus., vol. xi, p. 18, pl. ix, f. 3, 1888.
Miocene: John Day Valley, Oregon.

Ficus ovalis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 387, 1875 [1876]; Tert. Fl., p. 198, pl. xxx, f. 2, 1878.
———?: Pleasant Park, Colorado.

Ficus ovata Newby. Fl. Amboy Clays, p. 70, pl. xxiv, f. 1–3, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Ficus planicostata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 393, 1872 [1873]; Tert. Fl., p. 201, pl. xxxi, f. 1–8, 10–12, 1878.
Denver beds: Golden, Colorado.
Laramie group: Coal Creek, Marshalls, Colorado; Black Buttes, Wyoming.

Ficus planicostata Clintoni (Lx.) n. comb.
Ficus planicostata goldiana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 399, 1873 [1874]; Tert. Fl., p. 202, pl. xxxiii, f. 1, 1*a*, 2, 3, 1878.
Ficus Clintoni Lx. Ann. Rept., loc. cit., p. 393, 1872 [1873].
Denver beds: Golden, Colorado.
Eoligintic: Cross Lake, Louisiana.

Ficus planicostata goldiana Lx. = Ficus planicostata Clintoni.

Ficus planicostata latifolia Lx. = Ficus latifolia.

Ficus populina Heer. Fl. Tert. Helv., vol. ii, p. 66, pl. lxxxv, f. 1–7; lxxxvi, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 6, 1871 [1872]. [Not afterwards referred to by Lesquereux.]
Eocene?: Green River, Wyoming.

Ficus præcursor Lx. Fl. Dak. Gr., p. 81, pl. xlix, f. 5, 1892.
Dakota group: Kansas.

Ficus primordialis Heer. Phyll. Crét. d. Nebr., p. 16, pl. iii, f. 1, 1866.
Dakota group; Tekamah, Nebraska.

Ficus proteoides Lx. Fl. Dak. Gr., p. 77, pl. xii, f. 2, 1892.
Dakota group: Kansas.

Ficus protogæa? Ett. Sitzb. Wien. Akad., vol. lv, p. 249, pl. ii, f. 5, 1867; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 51, pl. 175, f. 4, 1894.
Cretaceous: Glen Cove, Long Island.

Ficus pseudo-populus Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 387, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr, p. 313, 1874 [1876]; Tert. Fl., p. 204, pl. xxxiv, f. 1*a*, 2, 1878.
Green River group: Unknown.
Laramie group?: Evanston, Wyoming.

Ficus reticulata (Lx.) n. comb.
Laurophyllum reticulatum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 425, 1872 [1873]; Cret. Fl., p. 76, pl. xv, f. 4, 5, 1874.
Ficus laurophyllum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 342, pl. v, f. 7, 1874 [1876]; Cret. and Tert. Fl., p. 49, pl. i, f. 12, 13, 1878; Fl. Dak. Gr., p. 85, 1892.
Dakota group: Kansas.

Ficus? rhomboideus Lx.=Phyllites rhomboideus.

Ficus rotundata Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 60, pl. ix, f. 32, 33*a*, 1893 [1894].
Upper Cretaceous: Vancouver Island.

Ficus Schimperi Lx. Trans. Am. Phil. Soc., vol. xiii, p. 417, pl. xviii, f. 1-3, 1869.
Eolignitic: Mississippi.

Ficus shastensis Lx. Proc. U. S. Nat. Mus., vol. xi, p. 28, pl. xi, f. 3, 1888.
Miocene: Shasta County, California.

Ficus sinuosa Ward. Bull. U. S. Geol. Surv., no. 37, p. 41, pl. xxii, f. 2, 1887.
Laramie group: Black Buttes, Wyoming.

Ficus? Smithsoniana Lx. Tert. Fl., p. 200, pl. xxxii, f. 5, 1878.
Juglans Smithsoniana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr, 1871, suppl., p. 16, 1871 [1872].
Laramie group: Raton Mountains, New Mexico; Mount Carbon, near Morrison, Colorado.

Ficus sordida Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 17, pl. iv, f. 6, 7, 1878.
Miocene: Chalk Bluffs, California.

Ficus speciosissima Ward. Bull. U. S. Geol. Surv., no. 37, p. 39, pl. xxi, f. 3, 1887.
Montana formation: Point of Rocks, Wyoming.

Ficus spectabilis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 379, 1872 [1873]; Tert. Fl., p. 199, pl. xxxiii, f. 4–6, 1878.
  Denver group: Golden, Colorado.
  Eolignitic: Cross Lake and McLees, Louisiana.

Ficus Sternbergii Lx. Fl. Dak. Gr., p. 82, pl. l, f. 1, 1892.
  Dakota group: Kansas.

Ficus Sternbergii Lx. [1872]=Persea Sternbergii.

Ficus subtruncata Lx.=Ficus auriculata.

Ficus tenuinervis Lx. Cret. and Tert. Fl., p. 164 pl. xliv, f. 4, 1883.
  Green River group: Alkali Station, Wyoming.
  Eocene?: Cherry Creek, Oregon.

Ficus tiliæfolia (Al. Br.) Heer. Fl. Tert. Helv., vol. ii, p. 68, pl. lxxxiii, f. 3–12; lxxxiv, f. 1–6; lxxxv, f. 14, 1856; Lx., Tert. Fl., p. 203, 1878.
    Cordia? tiliæfolia Al. Br. Leonh. and Brown, N. Jahrb., 1845, p. 170, 1845.
    Dombeyopsis tiliæfolia (Al. Br.) Ung. Gen. et Sp. Pl. Foss., p. 447, 1850.
    Dombeyopsis æquifolia Göpp. Lesquereux, Ann. Rept., op. cit., p. 10, 1871 [1872].
  Miocene: California.
  Fort Union group: Burns Ranch, Montana.
  Denver group: Golden, Colorado.
  Laramie group: Many localities.

Ficus truncata? Lx.=Ficus auriculata.

Ficus ulmifolia Lx.=Ficus uncata.

Ficus uncata Lx. Tert. Fl., p. 197, pl. xxxv, f. 1, 1*a*, 2, 1878.
    Ficus ulmifolia Lx. Ann. Rept. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 14, 1871 [1872].
    Ficus arenacea Lx., ex. p. Ann. Rept., loc. cit., p. 300, 1871 [1872].
    Ficus arenacea brevipetiolata Lx. Tert. Fl., p. 195, pl. xxix, f. 2, 3, 5, 1878.
    Populus monodon Lx. Tert. Fl., p. 180, pl. xxiv, f. 1, 1878.
    Ficus Gaudini Lx. Ann. Rept., loc. cit., p. 300, 1871 [1872].
    Ficus Crossii Ward. Bull. U. S. Geol. Surv., p. 39, pl. xxi, fig. 2, 1887.
  Laramie group: Fishers Peak, New Mexico; Coal Creek, Colorado.

Ficus ? undulata Lx. Fl. Dak. Gr., p. 84, pl. xii, f. 5, 1892.
  Dakota group: Kansas.

Ficus Ungeri Lx. Ann. Rept., U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 7, 1871 [1872]; Tert. Fl., p. 195, pl. xxx, f. 3, 1878; Cret. and Tert. Fl., p. 163, pl. xliv, f. 1–3, 1883.
  Green River group: Green River?

Ficus viburnifolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 42, pl. xxii, f. 4–8, 1887.
  Fort Union group: Clear Creek, Montana.

Ficus virginiensis Font. Potomac Fl., p. 295, pl. cxliii, f. 1, 3; cxliv, f. 1, 1889.
  Potomac formation: Fredericksburg, Virginia.

Ficus wellingtoniæ Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 60, pl. ix, f. 33, 34, 1893 [1894].
  Upper Cretaceous: Wellington Mine and Port McNeill, Vancouver Island.

Ficus Willisiana Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 52, pl. 176, f. 2, 5, 1894.
Cretaceous: Glen Cove and Sea Cliff, Long Island.

Ficus Woolsoni Newby. In MSS. Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 33, pl. ii, f. 1, 2c, 1892; Newby., Fl. Amboy Clays, p. 70, pl. xx, f. 3; xxiii, f. 1-6, 1895 [1896].
Cretaceous: Staten Island.
Amboy clay: Woodbridge, Sayreville, New Jersey.

Ficus wyomingiana Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 387, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 314, 1874 [1876]; Tert. Fl., p. 205, pl. xxxiv, f. 3, 1878.
Laramie group?: Evanston, Wyoming.

Ficus zizyphoides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 399, 1873 [1874].
——— ?: Golden, Colorado.

Ficus ? sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 89, f. (in text) 27, 1890.
Eocene?: Similkameen Valley, British Columbia.

Ficus sp., Lx. Am. Journ. Sci., vol. xxvii, p. 361, 1859.
———: Nanaimo, Vancouver Island.

Ficus sp., Kn. In Vaughan, Am. Geol., vol. xvi, p. 308, 1895.
Eolignitic: Old Port Caddo Landing, Harrison County, Texas.

Ficus sp., Kn. In Vaughan, Am. Geol., vol. xvi, p. 308, 1895.
Eolignitic: Old Port Caddo Landing, Harrison County, Texas.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
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Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 141, 1897.
Laramie group ? : "Dutton Creek Coal," Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 141, 1897.
Laramie group ? : "Dutton Creek Coal," Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 140, 1897.
Laramie group ? : North Fork Dutton Creek, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 145, 1897.
Laramie group: Rock Springs, Wyoming.

Ficus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 145, 1897.
Fort Union group: Black Buttes, Wyoming.

FITTONIA Carruthers. Trans. Linn. Soc. London, vol. xxvi, p. 680, 1868.

FLABELLARIA (comm.) L'Héritier. Stirp. Nov., p. 59, 1785.

Flabellaria communis Lx. = Flabellaria eocenica.

Flabellaria eocenica Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 391, 1872 [1873]; Tert. Fl., p. 111, pl. xiii, f. 1–3, 1878.
Sabal communis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 311, 1874 [1876].
Flabellaria communis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 385, 1875 [1876].
Laramie group: Black Buttes, Wyoming; Golden, Colorado.

Flabellaria florissanti Lx. Cret. and Tert. Fl., p. 144, pl. xxiv, f. 1–2*a*, 1883.
Green River group: Uinta County, formerly but wrongly called Randolph County, Wyoming.

Flabellaria latania Rossm. Verstein. Braunkohl. v. Altsattel, p. 39, pl. xi, f. 49, 1840; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 377, 1872 [1873]. [Not afterwards recognized by Lesquereux.]
———: Golden, Colorado.

Flabellaria longirachis Ung. Lx. 1873 = Geonomites tenuirachis.

Flabellaria? minima Lx. Cret. Fl., p. 56, pl. xxx, f. 12, 1874.
Dakota group: Western Kansas.

Flabellaria Zinckeni Heer Lx. 1872 = Geonomites goldianus.

FONTAINEA Newberry. Fl. Amboy Clays, p. 94, 1895 [1896.]

Fontainea grandifolia Newby. Fl. Amboy Clays, p. 96, pl. xlv, f. 1–4, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

FONTINALIS Linnæus. Gen. Pl., p. 323, 1737.

Fontinalis pristina Lx. Cret. and Tert. Fl., p. 135, pl. xxi, f. 9, 1883.
Green River group: Florissant, Colorado.

Fontinalis sp., Dn. Can. Nat., vol. iii, new ser., p. 73, 1868.
Pleistocene: Greens Creek, Ottawa River, Canada.

Fontinalis sp., Hinde. Canadian Journal [Can. Institute], vol. xv, p. 399, 1878.
Interglacial: Scarboro Heights, Ontario.

Fragment No. 1 Font. Potomac Fl., p. 190, 1889.
Potomac formation: Between Washington and Baltimore.

Fragment No. 2 Font. Potomac Fl. p. 192, 1889.
Potomac formation: Baltimore, Maryland.

FRAXINUS Tournefort ex Linnæus. Syst., ed. i, 1735.

Fraxinus abbreviata Lx. Cret. and Tert. Fl., p. 170, pl. xxviii, f. 5, 6, 1883.
Green River group: Florissant, Colorado.

Fraxinus affinis Newby. Proc. U. S. Nat. Mus., vol. v, p. 510, 1882 [1883].
Miocene? : Bridge Creek, Oregon.

Fraxinus Brownellii Lx. Tert. Fl., p. 230, 1878.
Green River group: South Park, Colorado.

Fraxinus denticulata Heer. Fl. Foss. Arct., vol. i, p. 118, pl. xvi, f. 4, 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 407, 1872 [1873]; Tert. Fl., p. 228, pl. xl, f. 1, 2, 1878.
Livingston beds: Bozeman coal field, Montana.
Laramie group? : Evanston, Wyoming?

Fraxinus eocenica Lx. Tert. Fl., p. 229, 1878; Cret. and Tert. Fl., p. 123, pl. xx, f. 1–3, 1883.
Denver beds: Golden, Colorado.

Fraxinus Heerii Lx. Cret. and Tert. Fl., p. 169, pl. xxxiii, f. 5, 6, 1883.
Green River group: Florissant, Colorado.

Fraxinus herendeenensis Kn. Proc. U. S. Nat. Mus., vol. xvii, p. 224, pl. ix, f. 7, 1894.
Eocene? : Herendeen Bay, Alaska.

Fraxinus intigrifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 509, 1882 [1883].
Miocene? : Bridge Creek, Oregon.

Fraxinus Libbeyi Lx. Cret and Tert. Fl., p. 171, pl. xxvii, f. 5–7, 9, 1883.
Green River group: Florissant, Colorado.

Fraxinus mespilifolia Lx. Cret and Tert. Fl., p. 169, pl. xxxiii, f. 7–12, 1883.
Green River group: Florissant, Colorado.

Fraxinus ? myricæfolia Lx. Cret and Tert. Fl., p. 170, pl. xxxiii, f. 13, 14, 1883.
Green River group: Florissant, Colorado.

Fraxinus prædicta Heer. Fl. Tert. Helv., vol. iii, p. 22, pl. civ, f. 12, 13, 1859; Lx., Ann. Rept., op. cit., p. 414, 1873 [1874]; Tert. Fl., p. 229, pl. xl, f. 3, 1878.
Denver beds: Golden, Colorado.
Green River group: Near Florissant, Colorado.

Fraxinus quadrangulata Michx. Penhallow in Coleman, Journ. Geol., vol. iii, p. 635, 1895.
Interglacial: Don Valley, Canada.

Fraxinus Ungeri Lx. Cret. and Tert. Fl., p. 171, 1883.
Green River group: Florissant, Colorado.

Fraxinus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 142, 1897.
Laramie group?: "Dutton Creek Coal," Wyoming.

FRENELITES Endlicher. Synop. Conif., p, 273, 1847.

Frenelites Reichii Ett. Hollick, Trans. N.Y. Acad. Sci., vol. xii, p. 29, pl. i, f. 23, 1892.
Cretaceous: Kreischerville, Staten Island; Marthas Vineyard.

FRENELOPSIS Schenk. Palæontographica, vol. xix, p. 13, 1869.

Frenelopsis gracilis Newby. Fl. Amboy Clays, p. 59, pl. xii, f. 1–3*a*, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Frenelopsis Hoheneggeri (Ett.) Schenk? Palæontographica, vol. xix, heft i, p. 13, pl. iv, f. 5–7; v, f. 1, 2; vi, f. 1–6; vii, f. 1, 1869; Newby., Fl. Amboy Clays, p. 58, pl. xii, f. 4, 5, 1395 [1896].
Amboy clay: Woodbridge, New Jersey.
Trinity division: Glenrose, Texas.

Frenelopsis parceramosa Font. Potomac Fl., p. 218, pl. cxi, f. 1–5; cxii, f. 1–5; clxviii, f. 1, 1889.
Potomac formation: Trents Reach, Virginia.

Frenelopsis ramosissima Font. Potomac Fl., p. 215, pl. xcv–xcix; c, f. 1–3; ci, f. 1, 1889.
Potomac formation: Fredericksburg, Virginia; Baltimore, Maryland.

Frenelopsis varians Font. Proc. U. S. Nat. Mus., vol. xvi, p. 273, pl. xl, f. 1, 2; pl. xli, f. 1–3*a*, 1893.
Trinity division: Glenrose, Texas.

Fruit capsules sp., Font. Potomac Fl., p. 272, pl. cxxxv, f. 14, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

FUCUS (Tournefort) Linnæus. Gen. Pl., p. 326, 1737.

Fucus lignitum Lx. Bull. U. S. Geol. and Geog. Surv. Terr., vol. i, p. 364, 1875 [1876]; Tert. Fl., p. 42, pl. lxi, f. 24, 24*a*, 1878.
Montana formation: Point of Rocks, Wyoming.
Fort Union group: Burns Ranch, Montana.

Fucus digitatus Penhallow. Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 66, 71, 1896.
Fucus sp., Penhallow. Bull. Geol. Soc. Am., vol. i, p. 332, 1890.
Pleistocene: Greens Creek and Besserer wharf, Ottawa River.

Fucus sp., Penhallow = Fucus digitatus.

GALLA Ludwig. Palæontogr., vol. v, p. 108, 1857.

Galla quercina Lx. Fl. Dak. Gr., p. 58, pl. vii, f. 2, 1892.
Dakota group: Kansas.

GAYLUSSACCIA Humbolt, Bonpland, and Kunth. Nov. Gen. et Sp., vol. iii, p. 275, 1818.

Gaylussaccia resinosa T. and G. Dn., Can. Nat., vol. iii, new ser., p. 71, f. (in text.) 1, 1868; Geol. Hist. Pl., p. 228, f. 77, 1888.
Pleistocene: Greens Creek, Ottawa River, Canada.

GEINITZIA Endlicher. Synops. Conif., p, 280, 1847.

Geinitzia formosa Heer. Neue Denkschr. Schweiz. Ges., vol. xxiv, p. 6, pl. i, f. 9, pl. ii, 1871; Newby., Fl. Amboy Clays, p. 51, pl. ix, f. 9, 1895 [1896].

Amboy clay: New Jersey.

Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Geinitzia sp., Newby. Proc. Lyc. Nat. Hist. N. Y., 2d ser., Jan. 3 to Mar. 3, 1873, p. 10, 1873.

Cretaceous: Keyport, New Jersey.

Geinitzia Heer, species? Lx., Cret. Fl., p. 54, 1874.

Dakota group: Sioux City, Iowa.

GEONOMITES Visiani. Mem. dell' Istituto Veneto (Palmæ Pinnatæ Tertiariæ) 1864, p. 456, 1864.

Geonomites goldianus Lx. Tert. Fl., p. 115, pl. iv, f. 9, 1878.

Palmacites goldianus Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 385, 1875; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 311, 1874 [1876].

Flabellaria Zinckeni Heer. Lesquereux, Ann. Rept., op. cit., p. 377, 1872 [1873]; Tert. Fl., p. 110, pl. ix, f. 6–8, 1878.

Denver group?: Golden, Colorado.

Green River group?: Barrell Springs, Wyoming.

Geonomites graminifolius Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 44, 1888.

Denver group: Golden, Colorado.

Geonomites Schimperi Lx. Tert. Fl., p. 116, pl. x, f. 1, 1878.

Laramie group?: Yellowstone National Park.

Miocene?: Contra Costa, California.

Geonomites tenuirachis Lx. Tert. Fl., p. 117, pl. xi, f. 1, 1878.

Flabellaria longirhachis? Ung. Gen. et. Sp. Pl. Foss., p. 332, 1850; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1873 [1874].

Laramie group: Raton Mountains, New Mexico.

Geonomites Ungeri Lx. Tert. Fl., p. 118, pl. xi, f. 2, 1878.

Laramie group: Raton Mountains, New Mexico.

GINKGO Linnæus. Mant., ii, p. 313, 1771.

Ginkgo adiantoides (Ung.) Heer. Fl. Foss. Arct., vol. v, abt. iii, p. 21 pl. ii, f. 7–10, 1878; Ward, Bull. U. S. Geol. Surv., no. 37, p. 15, pl. i, f. 5, 6, 1887.

Salisburia adiantoides Ung. Synop. Pl. Foss., p. 211, 1845.

Livingston beds: Bozeman coal field, Montana.

Fort Union group: Seven-Mile Creek, Montana; Similkameen River, British Columbia.

Ginkgo baynesiana (Dn.) n. comb.

Salisburia baynesiana Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 25, pl. v, f. 21, 21*a*, 1882 [1883].

Upper Cretaceous: Baynes Sound and Beaver Harbor, Vancouver Island.

Ginkgo? binervata (Lx.) n. comb.

Salisburia binervata Lx. Trans. Am. Phil. Soc., vol. xiii, p. 412, pl. xv, f. 3–6, 1869.

Eolignitic: Mississippi.

Ginkgo laramiensis Ward. Science, vol. v, p. 496, f. 7, 1885; Bull. U. S. Geol. Surv., no. 37, p. 15, pl. i, f. 4, 1887.

Montana formation: Point of Rocks, Wyoming.

Ginkgo lepida Heer. Fl. Foss. Arct., vol. iv, abt. ii, p. 62, pl. xii; vii, f. 7, 1876.

Salisburia (Gingko) lepida Heer. Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 8, pl. ii, f. 2, 1885 [1886].

Kootanie: Martin and Coal Creek, British Columbia.

Ginkgo nana (Dn.) n. comb.

Salisburia (Ginkgo) nana Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 8, pl. ii, f. 3, 1885 [1886].

Kootanie: Coal Creek, British Columbia.

Ginkgo pusilla (Dn.) n. comb.

Salisburia pusilla Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 56, pl. vi, f. 11–13, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver.

Ginkgo sibirica Heer. Fl. Foss. Arct., vol. iv, abt. ii, p. 61, pl. vii, f. 6; ix, f. *5f;* xi, 1876.

Salisburia (Ginkgo) sibirica Heer. Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 8, pl. ii, f. 1, 1885 [1886].

Kootanie: Martin Creek, British Columbia.

Ginkgo sp.

Carpites myricarum Lx. Tert. Fl., p. 303, pl. lx, f. 8–11, 1878.

Laramie group: Black Buttes, Wyoming.

Ginkgo sp. (Dn.) n. comb.

Salisburia sp., Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 18, 1885 [1886].

Canadian Upper Laramie: Near Calgary, Canada.

Ginkgo sp.

Salisburia, nuts of, Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 9, pl. ii, f. 4, 1885 [1886].

Kootanie: Kootanie series, British Columbia (no locality).

Ginkgo sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]

Belly River series: South Saskatchewan; West of Medicine Hat.

Ginkgo sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 34, 1887. [Wood.]

Canadian Upper Laramie: Souris River, Mackenzie River.

GLEDITSCHIA Clayton, ex Linnæus. Gen., ed. ii, p. 480, 1742.

Gleditschia triacanthos L. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 365, 1859.

Pleistocene: Banks of Mississippi River, near Columbus, Kentucky.

GLEICHENIA Smith. Mem. Ac. Turin, vol. v, p. 418, 1791.

Gleichenia Giesekiana ? Heer. Fl. Foss. Arct., vol. i, p. 78, pl. xliii, f. 1*a*, 2*a*, 3*a*, 1868; Fl. Amboy Clays, p. 36, pl. iv, f. 12, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Gleichenia gracilis Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 52, pl. x, f. 1–11, 1874; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 11, pl. iii, f. 4, 1885 [1886].

Mill Creek series: Mill Creek.

Gleichenia Kurriana Heer. Neue Denkschr. Schw. Ges., vol. xxiii, p. 6, pl. ii, f. 1–4, 1869; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 421, 1872 [1873].

Mill Creek series: Mill Creek.

Dakota group: Fort Harker, Kansas.

Gleichenia micromera Heer? Fl. Foss. Arct., vol. iii, abt. ii, p. 55, pl. x, f. 14, 15, 1874; Fl. Amboy Clays, p. 36, pl. iii, f. 6, 1895 [1896].

Amboy clay: Sayreville, New Jersey.

Gleichenia Nordenskiöldi ? Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 50, pl. ix, f. 6–12, 1874; Font., Potomac Fl., p. 119, pl. xxi, f. 11, 1889.

Potomac formation: Dutch Gap Canal, Virginia.

Dakota group: Kansas.

Gleichenia Zippei Heer? Fl. Foss. Arct., vol. i, p. 79, pl. xlviii, f. 4, 1868; Fl. Amboy Clays, p. 37, pl. iii, f. 5, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

GLOSSOZAMITES Schimper. Pal. Vég., vol. ii, p. 163, 1870.

Glossozamites distans Font. Potomac Fl., p. 176, pl. lxviii, f. 5, 1889.

Potomac formation: Fredericksburg, Virginia.

Glossozamites Klipsteini (Dunk.) Font. In Diller and Stanton, Bull. Geol. Soc. Am., vol. v, p. 450, 1894.

Cyclopteris Klipsteini Dunk. Monogr. d. Nordd. Wealdenb., p. 11, pl ix, f. 7, 1846.

Horsetown beds: Tehama and Shasta counties, California.

GLYPTOSTROBUS Endlicher. Synop. Conif., p. 69, 1847.

Glyptostrobus brookense (Font.) Ward. 15th Ann. Rept. U. S. Geol. Surv., p. 359, 1895.

Taxodium (Glyptostrobus) brookense Font. Potomac Fl., p. 254, pl. cxxii, f. 1; cxxiv, f. 3–9; cxxxi, f. 5; clxv, f. 1–3; clxvi, f. 4, 7; clxvii, f. 3, 1889.

Potomac formation: Near Brooke, Virginia.

Glyptostrobus brookense angustifolium (Font.) n. comb.

Taxodium (Glyptostrobus) brookense angustifolium Font. Potomac Fl., p. 256, pl. clxvii, f. 1, 1889.

Potomac formation: White House Bluff.

Glyptostrobus europæus (Brongn.) Heer. Fl. Tert. Helv., vol. i, p. 51, pl. xix; xx, 1855; Lx., Tert. Fl., p. 74, pl. vii, f. 1, 2, 1878.

Taxodium europæum Brongn. Ann. d. Sci. Nat., vol. xxx, p. 168, 1833.
Taxodites europæus (Brongn.) Endl. Synop. Conif., p. 278, 1847.

Miocene?: Birch Bay, British Columbia.

Eocene?: Alaska.

Green River group: Florissant, Colorado.

Fort Union group: Mouth of Yellowstone, Montana.

Glyptostrobus europæus Ungeri Heer. Fl. Tert. Helv., vol. iii, p. 159, 1859; Lx., Cret. and Tert. Fl., p. 222, pl. xlvi, f. 1-1*c*, 1883.

Glyptostrobus Ungeri Heer. Fl. Tert. Helv., vol. i, p. 52, 1855.

Eocene?: Alaska.

Fort Union group: Bad Lands, Dakota; Porcupine Creek.

Glyptostrobus fastigiatus (Font.) Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 380, 1895.

Taxodium (Glyptostrobus) fastigiatum Font. Potomac Fl., p. 253, pl. cxxv, f. 1, 3, 1889.

Potomac formation: Near Brooke, near Potomac Run, Virginia.

Glyptostrobus gracillemus Lx. = Sequoia gracillima.

Glyptostrobus grœnlandicus Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 76, pl. xvii, f. 9, xx, f. 9, 10, xxii, f. 12, 1874; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv., p. 9, pl. iii, f. 8, 1885 [1886].

Kootanie: North Branch Old Man River, British Columbia.

Glyptostrobus Ungeri Heer.* Fl. Tert., Helv., vol. i, p. 52, 1855; Dn., Trans. Roy. Soc. Canada, vol. vii, sec. iv, p. 70, 1889 [1890]; Lx., Cret. and Tert. Fl., p. 139, pl. xxii, f. 1–6*a*, 1883. [* This is probably the same as that referred above to *G. europæus Ungeri.* It is left in this unsatisfactory manner until the subject can be thoroughly revised with abundant material at hand for determining the exact status. F. H. K.]

Miocene: John Day Valley, Oregon.

Green River group: Florissant, Colorado.

Eocene?: Mackenzie River.

Glyptostrobus Ungeri Heer = G. europæus Ungeri?

Glyptostrobus sp., Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 25, 1882 [1883].

Upper Cretaceous: Baynes Sound, Vancouver Island.

Glyptostrobus sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 79, f. (in text) 7, 1890.

Miocene?: Similkameen River and Stump Lake, British Columbia.

Goniopteris polypodioides Ett. = Dryopteris polypodioides.

Goniopteris pulchella? Heer.* Lesquereux, Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 383, 1875 [1876]. [* Not afterwards referred to by Lesquereux; included in some other species, but no record remains of transfer.]

Laramie group?: Golden, Colorado.

GREWIA Linnæus. Syst., ed. i, 1735.

Grewia auriculata Lx. Cret. and Tert. Fl., p. 252, pl. lv, f. 1, 1883.

Miocene: Bridge Creek, Oregon.

? **Grewia celastroides** Ward. Bull. U. S. Geol. Surv., no. 37, p. 86, pl xxxix, f. 2, 1887.

Fort Union group: Iron Bluff, Montana.

Grewia crenata (Ung.) Heer. Fl. Tert. Helv., vol. iii, p. 42, pl. cix, f. 12–21; cx, f. 1–11, 1859; Ward, Bull. U. S. Geol. Surv., no. 37, p. 85, pl. xxxix, f. 1, 1887.

Dombeyopsis crenata Ung. Gen. et Sp. Pl. Foss., p. 448, 1850.

Fort Union group?: Bull Mountains, Montana.

Grewia obovata Heer. Fl. Foss. Arct., vol. iv, abt. i, p. 86, pl. xix, f. 15, 15*b*, 1876; Ward, Bull. U. S. Geol. Surv., no. 37, p. 88, pl. xxxix, f. 6, 7, 1887.

Fort Union group: Seven-Mile Creek, Montana.

?**Grewia Pealei** Ward. Bull U. S. Geol. Surv., no. 37, p. 87, pl. xxxix, f. 3–5, 1887.

Fort Union group?: Bull Mountains, Montana.

GREWIOPSIS Saporta. Études, ii, p. 45, 1866.

Grewiopsis acuminata Lx. Proc. U. S. Nat. Mus., vol. x, p. 44, pl. iii, f. 12, 13; iv, f. 1, 2, 1887.

Laramie group?: Unknown.

Grewiopsis æquidentata L. Fl. Dak. Gr., p. 180, pl. lviii, f. 4, 1892.

Dakota group: Kansas.

Gre(v)wiopsis Cleburni Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 380, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 306, 1874 [1876]; Tert. Fl., p. 259, pl. lxii, f. 12, 1878.

Laramie group: Hodges Pass, Wyoming.

Montana formation: Point of Rocks.

Grewiopsis eocenica (Lx.) n. comb.

Grewiopsis Saportanea Lx. Tert. Fl., p. 257, pl. l, f. 10–12, 1878.

Aleurites eocenica Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 397, 1872 [1873].

Laramie group: Black Buttes, Wyoming.

Grewiopsis ficifolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 92, pl. xli, f. 1, 2, 1887.

Laramie group, Black Buttes, Wyoming.

Grewiopsis flabellata (Lx.) n. comb.

Populites flabellata Lx. Am. Journ. Sci., vol. xlvi, p. 94, 1868.

Populites fagifolia Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 422, 1872 [1873].

Greviopsis Haydenii Lx. Cret. Fl., p. 97, pl. iii, f. 2, 4; pl. xxiv, f. 3, 1874.

Dakota group: Fort Harker, Kansas.

Greviopsis Haydenii Lx. = Grewiopsis flabellata.

Grewiopsis Mudgei Lx. Fl. Dak. Gr., p. 181, pl. lxvi, f. 3, 1892.

Dakota group: Kansas.

Grewiopsis paliurifolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 92, pl. xli, f. 3, 1887.

Laramie group: Black Buttes, Wyoming.

Grewiopsis platanifolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 89, pl. xl, f. 1, 1887.

Fort Union group: Seven-Mile Creek, Montana.

Grewiopsis populifolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 90, pl. xl, f. 3–5, 1887.

Fort Union group: Burns's Ranche, Montana.

Grewiopsis Saportanea Lx. = Grewiopsis eocenica.

Grewiopsis tenuifolia Lx. Tert. Fl., p. 258, pl. xl, f. 14, 1878.

Denver group: Golden, Colorado.

Grewiopsis viburnifolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 89, pl. xl, f. 2, 1887; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 59, pl. 174, f. 8, 1894.
Fort Union group: Burns's Ranche, Montana.
Cretaceous: Lloyds Neck, Long Island.

Grewiopsis Walcotti Lx. Proc. U. S. Nat. Mus., vol. x, p. 45, pl. iv, f. 3, 4, 1887.
———: Upper Kanab Valley, Utah.

GYMNOGRAMMA Desv. Berl. Mag. V., p. 304, 1811.

Gymnogramma Gardneri Lx. Tert. Fl., p. 58, pl. iv, f. 2, 1878.
Pteris Gardneri Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 393, 1873 [1874].
Laramie group?: Sand Creek, Colorado.

Gymnogramma Haydenii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 295, 1871 [1872]; Tert. Fl., p. 59, pl. v, f. 1-3, 1878.
Laramie group?: Yellowstone National Park, Wyoming.

Gymnospermous fruits Font. Potomac Fl., p. 262, 1889.

HALYMENITES Sternberg. Versuch., vol. ii, Fasc. v and vi, p. 29, 1833.

Halymenites major Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 373, 1872 [1873]; Tert. Fl., p. 38, pl. i, f. 7, 8, 1878.
Halymenites minor F. O. Ann. Rept., op. cit., p. 373, 1872 [1873]; Tert. Fl., p. 39, pl. i, f. 9, 1878.
Widely distributed from the Montana formation to the Eocene.

Halymenite minor F. O. Lx.=Halymenites major Lx.

Halymenites striatus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 373, 1872 [1873]; Tert. Fl., p. 37, pl. i, f. 6, 1878.
Laramie group: Raton Mountains, New Mexico.

HAMAMELITES Saporta. Études, II: Ann. d. Sci. Nat., 5th ser., Bot., vol. iii, p. 47 [43], 1865.

Hamamelites? cordatus Lx. Cret. and Tert. Fl., p. 71, pl. iv, f. 3, 1883.
Dakota group: Fort Harker, Kansas.

Hamamelites fothergilloides Sap. Études, II: Ann. Sci. Nat., Bot., 5th ser., vol. iii, p. 47, 1865; Ward, Bull. U. S. Geol. Surv., no. 37, p. 64, pl. xxix, f. 1, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Hamamelites kansaseana Lx.=Quercus kanseana.

Hamamelites quadrangularis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 355, 1874 [1876]; Cret. and Tert., Fl., p. 70, 1883.
Alnites quadrangularis Lx. Cret. Fl., p. 62, pl. iv, f. 1, 1874.
Populites quadrangularis Lx. Am. Journ. Sci., vol. xlvi, p. 94, 1868.
Dakota group: Kansas?

Hamamelites quercifolius Lx. Cret. and Tert. Fl., p. 71, 1883.
Dakota group: Kansas.

Hamamelites tenuinervis Lx. Cret. and Tert. Fl., p. 70, 1883.
Dakota group: Kansas.

HAUSMANNIA F. Mueller. Fragm. Phyt. Austral., vol. iv, p. 148, 1864.

Hausmannia rigida Newby. Fl. Amboy Clays, p. 35, pl. i, f. 2, 3, 5, 1895 [1896].
Amboy clay: Woodbridge, South Amboy, New Jersey.

HEDERA Tournefort ex. Linnæus. Gen., ed. i, p. 56, 1737.

Hedera aquamara Ward=Quercus aquamara.

Hedera auriculata Heer. Fl. Foss. Alask., p. 36, pl. ix, f. 6, 1869.
Eocene?: Port Graham, Alaska.

Hedera Bruneri Ward. Bull. U. S. Geol. Surv., no. 37, p. 58, pl. xxvi, f. 6, 1887.
Laramie group: Black Buttes, Wyoming.

Hedera cretacea Lx. Fl. Dak. Gr., p. 127, pl. xviii, f. 1, 1892.
Dakota group: Kansas.

Hedera decurrens Lx. Fl. Dak. Gr., p. 130, pl. xviii, f. 6, 1892.
Dakota group: Kansas.

Hedera MacClurii Heer. Fl. Foss. Arct., vol. i, p. 119 pl. xvii, f. 1*a*, 2*c*, 3, 4, 5*a*; p. 138; pl. xxi, f. 17*a*, 1868.
Miocene?: Mackenzie River.

Hedera marginata Lx. Cret. and Tert. Fl., p. 177, pl. xl, f. 8, 1883.
Green River group: Florissant, Colorado.

Hedera microphylla Lx. Fl. Dak. Gr., p. 127, pl. xviii, f. 2, 3, 1892.
Dakota group: Kansas.

Hedera minima Ward. Bull. U. S. Geol. Surv., no. 37, p. 57, pl. xxvi, f. 5, 1887.
Fort Union group: Clear Creek, Montana.

Hedera obliqua Newby. Fl. Amboy Clays, p. 113, pl. xxxvii, f. 8; xxxviii, f. 5, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Hedera orbiculata (Heer) Lx. Fl. Dak. Gr., p. 129, pl. xvii, f. 12–14, 1892.
Chondrophyllum orbiculatum Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 115, pl. xxxi, f. 3*c*, 1874.
Dakota group: Kansas.

Hedera ovalis Lx. Cret. Fl., p. 91, pl. xxv, f. 3; pl. xxvi, f. 4, 1874.
Chondrophyllum Nordenskiöldi? Heer. In Lx., Fl. Dak. Gr., p. 129.
Dakota group: Nebraska and Kansas.
Mill Creek series: Mill Creek.

Hedera parvula Ward. Bull. U. S. Geol. Surv., no. 37, p. 57, pl. xxvi, f. 4, 1887.
Fort Union group: Clear Creek, Montana.

Hedera platanoidea Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 351, pl. iii, f. 3, 1874 [1876]; Fl. Dak. Gr., p. 128, 1892.
Dakota group: Fort Harker, Kansas.

Hedera primordialis Sap. Le Monde des Pl., p. 200, f. 29, 1879; Newby., Fl. Amboy Clays, p. 113, pl. xix, f. 1, 9; xxxvii, f. 1-7, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Hedera Schimperi Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 395, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 351, pl. vii, f. 5, 1874 [1876]; Cret. and Tert. Fl., p. 65, pl. iv, f. 7, 1883.

Dakota group: Fort Harker, Kansas.

HEDERÆPHYLLUM Fontaine. Potomac Fl., p. 323, 1889.

Hederæphyllum angulatum Font. Potomac Fl., p. 324, pl. clxii, f. 1, 1889.

Potomac formation: Near Brooke, Virginia.

Hederæphyllum crenulatum Font. Potomac Fl., p. 324, pl. clxii, f. 3, 1889.

Potomac formation: Near Brooke, Virginia.

Hemitelites Torelli Heer. Fl. Foss. Arct., vol. ii, abt. iv, p. 462, 1869; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 5, 1871 [1872]. [This specimen was not afterwards referred to by Lesquereux.]

Eocene?: Green River, Wyoming.

Hemitelites Torelli Heer=Osmunda Doroschkiana.

HICORIA Rafinesque. Med. Rep. (II), vol. 5, p. 352, 1808.

Hicoria antiquorum (Newby.) n. comb.

Carya antiquorum Newby. Later Extinct Floras, p. 72, 1868; Lx., Tert. Fl., p. 289, pl. lvii, f. 1-5; pl. lviii, f. 2, 1878.

Fort Union group: Yellowstone Valley, Montana.

Denver group?: Carbon and Evanston, Wyoming; ? Cross Lake, Louisiana.

Upper Laramie group?: Porcupine Creek and Rocky Mountain House, Northwest Territory.

Hicoria Bruckmanni (Heer) n. comb.

Carya Bruckmanni? Heer. Fl. Tert. Helv., vol. iii, p. 93, pl. cxxvii, f. 52, 1859; Lx., Cret. and Tert. Fl., p. 191, pl. xxxix, f. 6, 1883.

Green River group: Florissant, Colorado.

Hicoria elænoides (Ung.) n. comb.

Carya elænoides (Ung.) Heer. Fl. Tert. Helv., vol. iii, p. 92, pl. cxxxi, f. 1-4, 1859; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 18, 1888.

Miocene: John Day Valley, Oregon.

Hicoria juglandiformis (Sternb.) n. comb.

Carya bilinica (Ung.) Ett. Abhandl. k. k. geol. Reichs., vol. i, p. 12, pl. ii, f. 17, 1852; Lesquereux, Cret. and Tert. Fl., p. 191, pl. xxxix, f. 1, 2, 13, 1883.

Juglans bilinica Ung. Gen. et Sp. Pl. Foss., p. 469, 1850.

Phyllites juglandiformis Sternb. Vers. 4. Index, Ic., pl. xxxv, f. 1, 1825.

Green River group: Florissant, Colorado.

Miocene: Spanish Peak and Shasta County, California.

Hicoria pecan (Marsh) Britton. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.

Carya olivæformis Nutt. Lx., Am. Journ. Sci., vol. xxvii, p. 365, 1859.

Miocene?: Bridgeton, New Jersey.

Pleistocene: Banks of Mississippi River, near Columbus, Kentucky.

Hicoria rostrata (Göpp.) n. comb.

Carya rostrata (Göpp.) Schimp. Pal. Vég., vol. iii, p. 257, 1874; Lx., Cret. and Tert. Fl., p. 191, pl. xxxix, f. 4, 1883.

Juglans rostrata Göpp. Palæontogr., vol. viii, p. 136, pl. lv, 1861.

Green River group: Florissant, Colorado.

Hicoria vermontana (Lx.) n. comb.

Carya vermontana Lx. Am. Journ. Sci., vol. xxxv, p. 357, 1861; Geol. Vt., vol. ii, p. 714, f. 130, 1861.

———: Brandon, Vermont.

Hicoria verrucosa (Lx.) n. comb.

Carya verrucosa Lx. Am. Journ. Sci., vol. xxxii, p. 357, 1861; Geol. Vt., vol. ii, p. 714, f. 129, 1861.

———: Brandon, Vermont.

Hicoria (Dn. sp.).

Carya sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]

Fort Pierre series: Head of Swift Current.

HYMENÆA Linnæus. Gen. Pl., p. 366, 1737.

Hymenæa dakotana Lx. Fl. Dak. Gr., p. 145, pl. lv, f. 2, 3; pl. lvi, f. 1, 2; pl. lxii, f. 2, 1892.

Dakota group: Kansas.

Amboy clay: New Jersey.

Cretaceous: Sea Cliff,? Long Island.

Hymenæa virginiensis Font. Potomac Fl., p. 320, pl. clxiii, f. 6, 1889.

Potomac formation: Near Brooke, Virginia.

HYMENOPHYLLUM Smith. In Römer, Arch. I, 2, p. 56, 1797.

Hymenophyllum confusum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 395, 1873 [1874]; Tert. Fl., p. 51, pl. ii, f. 6–*6a*, 1878.

Denver group: Golden, Colorado.

Hymenophyllum cretaceum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 421, 1872 [1873].

Dakota group: Fort Harker, Kansas.

HYPNUM Linnæus. Gen. Pl., p. 323, 1737.

Hypnum columbianum Penhallow. In Dn., Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 77, f. 3, 1890.

Miocene?: Quensel, Similkameen Valley, British Columbia.

Hypnum commutatum Hedw. Hinde, Canadian Journal [Can. Institute], vol. xv, p. 399, 1878.

Interglacial: Scarboro Heights, Ontario.

Hypnum fluitans L. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 65, 71, 1896.

Pleistocene: Besserer's wharf, Ottawa River.

Hypnum Haydenii Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 383, 1875; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 309, 1874 [1876]; Tert. Fl., p. 44, pl. v, f. 14–14*b*, 1878.

Green River group: South Park, Colorado.

Hypnum recurvans Schw. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 62, 71, 1896.

Pleistocene: Long Portage, Missinaibi River, Ontario.

Hypnum revolvens Swartz. Hinde, Canadian Journal [Can. Institute], vol. xv, p. 399, 1878.

Interglacial: Scarboro Heights, Ontario.

Hypnum sp., Hinde. Canadian Journal [Can. Institute], vol. xv, p. 399, 1878.

Interglacial: Scarboro Heights, Ontario.

ILEX (Tournefort) Linnæus. Syst., ed. i, 1735.

Ilex? affinis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 8, 1871 [1872]; Tert. Fl., p. 270, pl. l, f. 2, 3, 1878.

Green River group: Green River Station, Wyoming.

Ilex armata Lx. Fl. Dak. Gr., p. 176, pl. xxix, f. 8, 1892.

Dakota group: Kansas.

Ilex borealis Heer. Fl. Foss. Arct., vol. vii, p. 39, pl. lxiv, f. 3, 4, 1883; Lx., Fl. Dak. Gr., p. 176, pl. xxxv, f. 8, 1892.

Dakota group: Kansas.

Ilex Cassine L. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.

Miocene?: Bridgeton, New Jersey.

Ilex dakotensis Lx. Fl. Dak. Gr., p. 178, pl. xxix, f. 11, 1892.

Dakota group: Kansas.

Ilex dissimilis Lx. Tert. Fl., p. 271, pl. l, f. 7–9, 1878.

Quercus ilicoides? Heer. Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 291, 1871 [1872].

Green River group?: Sage Creek, Montana.

Ilex? elongata Newby. Fl. Amboy Clays, p. 98, pl. xviii, f. 1, 5, 1895 [1896].

Amboy clay: Sayreville, New Jersey.

Ilex grandifolia Lx. Cret. and Tert. Fl., p. 187, pl. xxxviii, f. 1, 1883.

Green River group: Florissant, Colorado.

Ilex insignis Heer. Fl. Foss. Alask., p. 37, pl. x, f. 1, 1869.

Eocene?: Port Graham, Alaska.

Ilex integrifolia (Hill) Chapm.

Prinos integrifolia Ell. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 365, 1859.

Pleistocene: Banks of Mississippi River, near Columbus, Kentucky.

Ilex Knightiæfolia Lx. Cret. and Tert. Fl., p. 188, pl. xl, f. 4, 5, 1883.

Green River group: Florissant, Colorado.

Ilex ? longifolia Heer. In Sismonda, Prod. Fl. Tert. Piémont, Mem. Acad. Sci. Turin, sec. ii, vol. xviii, p. — [reprint 29], pl. iii, f. 8, 1859; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 21, 1888.

Eocene: Cherry Creek, Oregon.

Ilex maculata Lx. Cret. and Tert. Fl., p. 186, pl. xliv, f. 5, 1883.
Green River group: Alkali Station, Wyoming.

Ilex Masoni Lx. Fl. Dak. Gr., p. 179, pl. vii, f. 6; lxiii f. 6, 1892.
Dakota group: Kansas.

Ilex microphylla Newby. Proc. U. S. Nat. Mus., vol. v, p. 510, 1882 [1883].
Fort Union group: Fort Union, Dakota.

Ilex microphylla Lx. Cret. and Tert. Fl., p. 186, 1883.
Green River group: Florissant, Colorado.

Ilex opaca Ait. Hollick, Bull. Torr. Bot. Club, xix, p. 331, 1892.
Miocene?: Bridgeton, New Jersey.

Ilex? ovata Newby. Fl. Amboy Clays, p. 98, pl. xviii, f. 2, 1895 [1896].
Amboy clay: Sayreville, New Jersey.

Ilex papillosa Lx. Fl. Dak. Gr., p. 177, pl. xxix, f. 9, 10; pl. lviii, f. 3, 1892.
Dakota group: Kansas.

Ilex prunifolia Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 27, pl. ix, f. 7, 1878.
Miocene: Table Mountain, California.

Ilex pseudo-stenophylla Lx. Cret. and Tert. Fl., p. 185, 1883.
Ilex stenophylla Ung. Chlor. Prot., p. 149, pl. l., f. 10–13, 1847; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., suppl., p. 8, 1871 [1872].
Green River group: Florissant, Colorado.

Ilex quercifolia Lx. Cret. and Tert. Fl., p. 186, pl. xxxviii, f. 2–5, 1883.
Green River group: Florissant, Colorado.

Ilex Scudderi Lx. Fl. Dak. Gr., p. 178, pl. lviii, f. 2, 1892.
Dakota group: Kansas.

Ilex sphenophylla? Heer. Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 415, 1873 [1874]. [Apparently not afterwards mentioned.]
Green River group?: Florissant, Colorado.

Ilex stenophylla Ung. Lesquereux=Ilex pseudo-stenophylla.

Ilex strangulata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 399, 1875 [1896]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr, p. 359, pl. viii, f. 3, 1874 [1876]; Cret. and Tert. Fl., p. 84, pl. iii, f. 7, 1883.
Dakota group?: Southwestern Colorado.

Ilex subdenticulata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 416, 1873 [1874]; Tert. Fl., p. 271, pl. l, f. 5, 6, *6a*, *6b*, 1878.
Green River group: Florissant, Colorado.

Ilex undulata Lx. Ann. Rept. U. S. Geol and Geogr. Surv. Terr., p. 416, 1873 [1874].
———?: Unknown.

Ilex vyomingiana Lx. Tert. Fl., p. 270, pl. l, f. 1, 1878.
Green River group: Green River Station, Wyoming.

ILLICIUM L. Syst., ed. x, p. 1050, 1759.

Illicium lignitum Lx. Am. Journ. Sci., vol. xxxii, p. 360, 1861; Geol. Vt., vol. ii, p. 716, f, 149, 1861.
———: Brandon Vermont.

INGA Scopoli. Introd., 298, 1777.

Inga cretacea Lx. Fl. Dak. Gr., p. 153, pl. lv, f. 11, 1892.
Dakota group: Kansas.

INOLEPIS Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 72, 1874.

Inolepis? sp., Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 392, 1875; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 337, pl. iv, f. 8, 1874 [1876].
Dakota group: Kansas.

ISŒTES Linnæus. Amœn. Acad., iii, 1751.

Isœtes brevifolius Lx. Cret. and Tert. Fl., p. 136, 1883.
Green River group: Florissant, Colorado.

IOXYLON Rafinesque. Am. Mo. Mag., vol. iv, p. 195, 1818.

Ioxylon pomiferum Raf. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Maclura auriantiaca Nutt. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, p. 69, 1896.
Miocene?: Bridgeton, New Jersey.
Pleistocene: Don Valley, Toronto.

JUGLANDIPHYLLUM Fontaine. Potomac Fl., p. 315, 1889.

Juglandiphyllum integrifolium Font. Potomac Fl., p. 315, pl. clvii, f. 3, 5, 6, 1889.
Potomac formation: Deep Bottom, White House Bluff, Virginia.

JUGLANDITES Sternberg. Vers., vol. i, p. xl, 1825.

Juglandites cretacea Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 14, 1885 [1886].
Mill Creek series: North Fork Old Man River, Canada.

Juglandites ellsworthianus Lx. Fl. Dak. Gr., p. 70, pl. xxxvii, f. i, 1892.
Dakota group: Kansas.

Juglandites fallax Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 59, pl. xi, f. 48, 1893 [1894].
Upper Cretaceous: Vancouver Colliery, Vancouver Island.

Juglandites Lacoei Lx. Fl. Dak. Gr., p. 71, pl. xlviii, f. 5, 1892.
Dakota group: Kansas.

Juglandites primordialis Lx. Fl. Dak. Gr., p. 70, pl. xxxv, f. 15, 1892.
Dakota group: Kansas.

Juglandites sinuatus Lx. Fl. Dak. Gr., p. 71, pl. xxxv, f. 9–11, 1892.
Dakota group: Kansas.

Juglandites? sp., Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv. p. 59, pl. x, f. 43; pl. xiii, f. 56, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island.

JUGLANS Linnæus. Gen., ed. i, p. 291, 1737.

Juglans acuminata Al. Br. Neues Jahrb. 1845, p. 170, 1845.
Eocene?: Port Graham, Alaska.

Juglans alkalina Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 382, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 308, 1874 [1876]; Tert. Fl., p. 288, pl. lxii, f. 6–9, 1878.
Green River group?: Alkali Station, Wyoming.

Juglans appressa Lx. Trans. Am. Phil. Soc., vol. xiii, p. 420, pl. xx, f. 6, 1869; Ann. Rept., op. cit., p. 294, 1871 [1872].
Eolignitic: Mississippi.

Juglans arctica Heer. Fl. Foss. Arct., vol. 6, abt. ii, p. 71, pl. xl, f. 2, 1882; in Lx., Fl. Dak. Gr., p. 68, pl. xix, f. 3; pl. xxxix, f. 5, 1892.
Amboy clay: Woodbridge, New Jersey?
Dakota group: Kansas.
Cretaceous: Glen Cove, Long Island; Marthas Vineyard, Mass.

Juglans baltica? Heer. Mioc. Balt. Fl., p. 98, pl. xxix, f. 8–12, 1869; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 398, 1872 [1873]. [Not afterwards mentioned by Lesquereux.]
———: Black Buttes, Wyoming.

Juglans bilinica Ung., 1850=Hicoria juglandiformis.

Juglans californica Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 34, pl. ix, f. 14; pl. x, f. 2, 3, 1878.
Miocene: Chalk Bluffs, California.

Juglans cinerea ? Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 330, 1875.
———: Porcupine Creek, Canada.

Juglans costata (Presl.) Brongn. Tableau d. Genres Vég. Foss., p. 168 [119], 1849; Lx., Cret. and Tert. Fl., p. 190, pl. xxxix, f. 5, 1883.
Juglandites costatus Presl. In Sternberg, Versuch, vol. ii, p. 207, 1833.
Juglans acuminata? Heer. Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 8, 1871 [1872].
Green River group: Florissant, Colorado.

Juglans crassipes Heer. Neue Denkschr. Schw. Gesel., vol. xxiii, mem. 2, p. 23, pl. vi, f. 3, 1869; Lx., Fl. Dak. Gr., p. 69, pl. xlix, f. 1–3; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 51, pl. 175, f. 3, 1894.
Dakota group: Kansas.
Cretaceous: Brooklyn, New York.

Juglans Crossii nom. nov.
Juglans denticulata Heer. Fl. Foss. Arct., vol. ii, abt. iv, p. 483, 1869; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 298, 1871 [1872]; Tert. Fl., p. 289, pl. lviii, f. 1, 1878. [J. denticulata Heer, 1869, preoccupied by J. denticulata O. Web., 1852].
Green River group: Green River, Wyoming.
Livingston beds: Bozeman coal field, Montana.
Denver group ?: Carbon, Wyoming.

Juglans Debeyana (Heer) Lx. Am. Journ. Sci., vol. xlvi, p. 101, 1868.
Populus? Debeyana Heer. Phyll. Crét. d. Nebr., p. 14, pl. i, f. 1, 1866.
Dakota group: Decatur, Nebr.; New Ulm, Minnesota.

Juglans dentata Newby. Proc. U. S. Nat. Mus., vol. v, p. 507, 1882 [1883].
Eocene: Green River, Wyoming.

Juglans denticulata Heer = Juglans Crossii.

Juglans egregia Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 36, pl. ix, f. 12; pl. x, f. 1, 1878.
Miocene: Chalk Bluffs, California.

Juglans florissanti Lx. Cret. and Tert. Fl., p. 190, 1883.
Green River group: Florissant, Colorado.

Juglans harwoodensis Dn. Trans. Roy. Soc., Canada, vol. i, sec. iv, p. 28, pl. viii, f. 31, 1882 [1883].
Upper Cretaceous: Nanaimo, Vancouver Island.

Juglans hesperia Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 723, pl. xcix, f. 8, 1898.
Payette formation: Marsh, Idaho.

Juglans laurinea Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 35, pl. ix, f. 11, 1878.
Miocene: Chalk Bluffs, California.

Juglans Leconteana Lx. Tert. Fl., p. 285, pl. liv, f. 10–13, 1878.
Denver group?: Evanston, Wyoming.
Laramie group: Marshall, Colorado.
Eocene?: Cherry Creek, Oregon.

Juglans nigella Heer. Fl. Foss. Alask., p. 38, pl. ix, f. 2–4, 1869; Lx., Cret. and Tert. Fl., p. 235, pl. xlviA, f. 11, 1883.
Eocene?: Port Graham, Alaska.
Fort Union group: Montana; Bad Lands, Dakota.

Juglans nigella Heer, Dn. Rept. 49th Parallel = Juglans rugosa.

Juglans obtusifolia Heer. Fl. Tert. Helv., vol. iii, p. 89, pl. cxxix, f. 9, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 12, 1871 [1872]. [Not afterwards mentioned by Lesquereux.]
Laramie group?: Evanston, Wyoming.

Juglans occidentalis Newby. Proc. U. S. Nat. Mus., vol. v, p. 507, 1882 [1883].
Eocene: Green River, Wyoming.

Juglans oregoniana Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 35, pl. ix, f. 10, 1878.
Miocene: Chalk Bluffs, California.

Juglans picroides Heer. Fl. Foss. Alask., p. 39, pl. ix, f. 5, 1869.
Eocene?: Port Graham, Alaska.

Juglans rhamnoides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 294, 1871 [1872]; Tert. Fl., p. 284, pl. liv, f. 6–9, 1878.

Rhamnus Rossmässleri Ung. Lx., Ann. Rept., op. cit., p. 314, 1874 [1876].

Livingston beds: Bozeman coal field, Montana.

Laramie group: Black Buttes, Wyoming.

Montana formation: Point of Rocks, Wyoming.

Fort Union group: Bad Lands, Dakota; Porcupine Creek, British Columbia.

Eocene?: Cherry Creek, Oregon.

Juglans rostrata Göpp.=Hicoria rostrata.

Juglans rugosa Lx. Am. Journ. Sci., vol. xlv, 2d ser., p. 206, 1868; Tert. Fl., p. 286, pl. liv, f. 5, 4; pl. lv, f. 1–9; pl. lvi, f. 1, 2, 1878.

Nyssa lanceolata Lx. Tert. Fl., p. 245, pl. xxxv, f. 5 [non f. 6], 1878.

Juglans nigella Heer, Dn. Rept. 49th Parallel.

Denver group: Bozeman coal field, Montana; Golden, Colorado.

Canadian upper Laramie: Great Valley.

Laramie group: Evanston, Wyoming? Black Buttes, Wyoming.

Eolignitic: Wickliffe, Kentucky.

Eocene?: Cherry Creek, Oregon; Lassen County, California.

Juglans Saffordiana Lx. Trans. Am. Phil. Soc., vol. xiii, p. 421, pl. xx, f. 7, 1869.

Eolignitic: Lagrange, Tennessee.

Juglans Schimperi Lx. Ann. Rept. U. S. Geol. and Geog. Surv. Terr. 1871, suppl., p. 8, 1871 [1872]; Tert, Fl., p. 287, pl. lvi, f. 5–10, 1878

Green River group: Green River, Wyoming.

Denver group: Golden, Colorado.

Canadian upper Laramie: Great Valley.?

Juglans Smithsoniana Lx.=Ficus Smithsoniana.

Juglans thermalis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 17, 1871 [1872]; Tert. Fl., p. 287, pl. lvi, f. 3, 4, 1878.

Denver beds: Golden, and Hot Springs, Middle Park, Colorado.

Juglans Townsendi Kn. Proc. U. S. Nat. Mus., vol. xvii, p. 222, pl. ix, f. 5, 1894.

Eocene?: Herendeen Bay, Alaska.

Juglans Ungeri Heer. Tert. Fl. Helv., vol. iii, p. 199, pl. clv, f. 18, 1859; Ward, Bull. U. S. Geol. Surv. No. 37, p. 33, pl. xiv, f. 6, 1887.

Fort Union group?: Burns's Ranch, Montana.

Juglans vetusta Heer. Fl. Tert. Helv., vol. iii, p. 90, pl. cxxvii, f. 40–44, 1859; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 22, 1888.

Eocene?: Cherry Creek, Oregon.

Juglans Woodiana Heer. Neue Denkschr., vol. xxi, p. 9, pl. ii, f. 4–7, 1865; Lx., Cret. and Tert. Fl., p. 236, 1883.

Eocene?: Burrard Inlet, British Columbia; Chignik Bay, Alaska.

Fort Union group: Bad Lands, Dakota.

Juglans sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 34, 1887. [Fossil wood.]

Canadian upper Laramie : Souris River.

Juglans sp., Kn. In Vaughan, Am. Geol., vol. xvi, p. 308, 1895.
Eolignitic: Old Port Caddo Landing, Harrison County, Texas.

Juglans sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 145, 1897.
Fort Union group: Black Buttes, Wyoming.

JUNCUS (Tournefort.) Linnæus. Syst., ed. i, 1735.

Juncus sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 5, 1871 [1872].
Green River group: Green River, Wyoming.

JUNIPERUS (Tournefort.) Linnæus. Syst., ed. i, 1735.

Juniperus hypnoides Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 47, pl. xliv, f. 3; xlvi, f. 18, 1882; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 29, pl. i, f. 1, 1892.
Cretaceous: Kreischerville, Staten Island; Marthas Vineyard, Mass.

Juniperus macilenta Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 47, pl. xxv, f. 10, 10*b*, 11, 1882; Newby., Fl. Amboy Clays, p. 54, pl. x, f. 7, 1895 [1896].
Dammara microlepis Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 47, 1882.
Amboy clay: Woodbridge, New Jersey.

KALMIA Linnæus. Diss. Chen., p. 18, 1750.

Kalmia Brittoniana Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 34, pl. ii, f. 6–8, 1892.
Cretaceous: Staten Island.

LARICOPSIS Fontaine. Potomac Fl., p. 232, 1889.

Laricopsis angustifolia Fontaine. Potomac Fl., p. 233, pl. cii, f. 9, 10; ciii, f. 1, 4, 1889.
Potomac formation: Near Dutch Gap Canal and Trents Reach, Virginia.

Laricopsis brevifolia Font. Potomac Fl., p. 234, pl. cii, f. 5, 6, 1889.
Potomac formation: Near Dutch Gap Canal and Trents Reach, Virginia.

Laricopsis longifolia Font. Potomac Fl., p. 233, pl. cii, f. 7, 8; ciii, f. 2, 3; clxv, f. 4; clxviii, f. 5, 6, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.
Trinity division: Glenrose, Texas.

LARIX Adanson. Fam. Pl., vol. 2, p. 480, 1763.

Larix americana Mx.=Larix laricina.

Larix churchbridgensis Penhallow. Am. Geol., vol. ix, p. 370, 1892.
Interglacial: Churchbridge, Manitoba.

Larix larcina (Du Roy) Kock.
Larix americana Mx. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 326, 1890; Trans. Roy. Soc. Canada, 2d ser., sec. iv, p. 60, 1896.
Pleistocene: Moose River, Montreal; Fort Madison, Iowa; New Brunswick; Scarboro Heights, Ontario.

LASTREA Presl. Pterid, p. 73, 1836.

Lastrea (Goniopteris) Fischeri Heer. Fl. Tert. Helv., vol. i, p. 34, pl. ix, f. 3, 1855; Lx., Cret. and Tert. Fl., p. 239, pl. l, f. 1, 1*a*, 1883.
Miocene: John Day Valley, Oregon.

Lastrea (Goniopteris) goldiana Lx. Tert. Fl., p. 56, pl. iv, f. 13, 1878.
Aspidium goldianum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 393, 1873 [1874].
Denver beds: Golden, Colorado.

Lastrea (Goniopteris) intermedia Lx. Tert. Fl., p. 56, pl. iv, f. 14, 1878.
Aspidium (Lastræa) pulchellum Heer. In Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 384, 1870 [1872].
Aspidium (Lastræa) Fischeri Heer. In Lx., loc. cit., p. 384, 1870 [1872].
Denver beds?: Golden, Colorado.

Lastrea (Goniopteris) Knightiana Newby. Proc. U. S. Nat. Mus., vol. v, p. 503, 1882 [1883].
Miocene?: Currant Creek, Oregon.

Lastræa (Goniopteris) polypodioides? Ett. = Dryopteris (Goniopteris) polypodioides.

Lastræa styrica Heer. Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 418, 1873 [1874]. [Not afterwards mentioned by Lesquereux.]
———?: Blakes Fork, Uinta Mountains.

Lathræa arguta Lx. = Dryopteris arguta.

LAURELIA Jussieu. In Ann. Mus. Par., vol. xiv, p. 134, 1809.

Laurelia primæva Lx. Fl. Dak. Gr., p. 108, pl. xx, f. 8, 1892.
Dakota group: Kansas.

LAURINOXYLON Felix. Die Holzopale Ungarns: Jahrb. d. k. Geol. Anstalt, vol. vii, p. 27, 1884.

Laurinoxylon aromaticum Felix = Perseoxylon aromaticum.

Laurinoxylon Branneri Kn. Ann. Rept. Geol. Surv. Ark. for 1889, vol. ii, p. 256, pl. ix, f. 8, 9; x, f. 1, 2; xi, f. 4, 1889.
Tertiary [Orange Sand]: Bolivar Creek, Poinsett County, and Big and Little Crow Creeks, St. Francis County, Arkansas.

Laurinoxylon Lesquereuxiana Kn. Ann. Rept. Geol. Surv. Ark. for 1889, vol. ii, p. 258, pl. x, f. 3, 4; xi, f. 3, 4, 1889.
Tertiary: Near Wittsburg, Cross County, Arkansas.

Laurinoxylon? sp., Kn. Ann. Rept. Geol. Surv. Ark. for 1889, vol. ii, p. 259, 1889.
Tertiary [Orange Sand]: Red Bluff, Jefferson County, Arkansas.

LAUROPHYLLUM Göppert. Neues Jahrb. 1853, p. 434, as nomen nudum: Die Tertiärfl. Java., p. 45, 1854.

Laurophyllum angustifolium Newby. Fl. Amboy Clays, p. 86, pl. xvii, f. 10, 11, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Laurophyllum debile Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 22, pl. ii, f. 7, 7*a*, 1882 [1883].
Mill Creek series: Forks of Peace River, Northwest Territory; North Fork Old Man River.

Laurophyllum ellsworthianum Lx.=Quercus ellsworthianus.

Laurophyllum insigne Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 61, pl. vii, f. 24, 25, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island.

Laurophyllum lanceolatum Newby. Fl. Amboy Clays, p. 87, pl. xvii, f. 1, 12, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Laurophyllum minus Newby. Fl. Amboy Clays, p. 86, pl. xvi, f. 7–9. 1895 [1896].
Amboy clay: New Jersey.

Laurophyllum reticulatum Lx.=Ficus reticulata.

LAURUS L. Gen., ed. i, p. 120, 1737.

Laurus acuminata Newby. Proc. U. S. Nat. Mus., vol. v, p. 511, 1882 [1883].
Fort Union group: Valley of the Yellowstone, Yellowstone.

Laurus angusta Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 76, pl. xx, f. 1*b*, 7; pl. xliii, f. 1*c*, 1882; Lx., Fl. Dak. Gr., p. 93, pl. xvi, f. 7, 1892.
Dakota group: Kansas.

Laurus antecedens Lx. Fl. Dak. Gr., p. 92, pl. xi, f. 3, 1892.
Dakota group: Kansas.

Laurus Brossiana Lx. = Persea Brossiana.

Laurus californica Lx. Cret. and Tert. Fl., p. 252, pl. lvii, f. 3; lviii, f. 6–8, 1883; Proc. U. S. Nat. Mus., vol. xi, p. 12, pl. iv, f. 1, 1888.
Miocene: Corral Hollow, California; Boaz, Graves County, Kentucky.

Laurus carolinensis Michx. = Persea Borbonia.

Laurus crassinervis Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 23, 1882 [1883].
Cretaceous: Susqua River, Northwest Territory.
Intermediate series (Cretaceous): North Fork Old Man River, British Columbia.
Mill Creek series (Cretaceous): Mill Creek.

Laurus Colombi Heer. Neue Denkschr., vol. xxi, p. 7, pl. i, f. 6, 1865.
———?: Nanaimo; Vancouver Island.

Laurus Fürstenbergii Al. Br. In Unger, Gen. et Sp. Pl. Foss., p. 423, 1850; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 26, 1888.
Miocene?: Corral Hollow, California.

Laurus grandis Lx. Cret. and Tert. Fl., p. 251, pl. lviii, f. 1, 3, 1883.
Miocene: Corral Hollow, California.

Laurus Hollæ Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 76, pl. xxxiii, f. 13; pl. xliv, f. *5b;* xlv, f. 3, 1882; Lx., Fl. Dak. Gr., p. 92, pl. xii, f. 8, 1892.

Dakota group: Kansas; Staten Island?

Laurus Knowltoni Lx. Fl. Dak. Gr., p. 94, pl. l, f. 4, 1892.

Dakota group: Kansas.

Laurus labrusca Ung. = Sterculia labrusca.

Laurus macrocarpus Lx. Am. Journ. Sci., vol. xlvi, p. 98, 1868; Cret. Fl., p. 74, pl. x, f. 2, 1874; Fl. Dak. Gr., p. 95, 1892.

Dakota group: Decatur, Nebraska.

Laurus (Carpites) microcarpa Lx. Fl. Dak. Gr., p. 93, pl. xvi, f. 8, 1892.

Dakota group: Kansas.

Laurus modesta Lx. Cret. and Tert. Fl., p. 53, pl. xvi, f. 4, 1883.

Dakota group: Morrison, Colorado.

Laurus nebrascensis Lx. Am. Journ. Sci., vol. xlvi, p. 98, 1868; Cret. Fl., p. 74, pl. x, f. 1; xxviii, f. 14, 1874.

Persea nebrascensis Lx. Trans. Am. Phil. Soc., vol. xiii, p. 431, pl. xxiii, f. 9, 10, 1869.

Dakota group: Decatur, Nebraska; Kansas; New Ulm, Minnesota.

Amboy clay?: Sayreville, New Jersey?

Laurus Newberryana Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 52, pl. 179, f. 5, 1892; Bull. Geol. Soc. Am., vol. vii, p. 13, 1895.

Cretaceous: Marthas Vineyard, Massachusetts.

Laurus obovata Web. Palæontogr., vol. ii, p. 180, pl. xx, f. 4, 1853; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 399, 1872 [1873]. [Not afterwards referred to by Lesquereux.]

——— ?: Black Buttes, Wyoming.

Laurus ocoteoides Lx., 1878 = Laurus Wardiana.

Laurus Omalii Sap. and Mar. Essai Vég. d. Marnes Heers., d. Gelinden, Mem. Cour. Acad. Belg., vol. xxxvii, 1873, p. 49, pl. vi, f. 1, 1874; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 52, pl. 176, f. 3, 6, 1894.

Cretaceous: Sea Cliff and Glen Cove, Long Island.

Laurus pedatus Lx. Trans. Am. Phil. Soc., vol. xiii, p. 418, pl. xix, f. 1, 1869.

Eolignitic: Mississippi.

Laurus plutonia Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 75, pl. xix, f. 1*d*, 2–4, etc., 1882; Lx., Fl. Dak. Gr., p. 91, pl. xiii, f. 5, 6; pl. xii, f. 5, 1892.

Amboy clay: New Jersey.

Clay marl: Cliffwood, New Jersey.

Dakota group: Kansas; New Ulm, Minnesota?

Cretaceous: Glen Cove, Long Island; Marthas Vineyard, Massachusetts.

Laurus præstans Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 368, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv., p. 305, 1874 [1876]; Tert. Fl., p. 215, pl. lxiii, f. 7, 1878.

Laramie group: Point of Rocks, Wyoming.

Laurus primigenia Ung. Gen. et Sp. Pl. Foss., p. 423, 1850; Heer, Proc. Acad. Nat. Sci. Phila., vol. x, p. 265, 1858; Lx., Ann. Rept., op. cit., p. 406, 1872 [1873]; Tert. Fl., p. 214, pl. xxxvi, f. 5, 6, 8, 1878; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 33, pl. ii, f. 20; iii, f. 3, 1892.

Denver beds: Golden, Colorado.
Denver beds?: Carbon and Evanston, Wyoming.
Montana formation: Point of Rocks, Wyoming.
Cretaceous?: Selma, Texas; Staten Island?

Laurus princeps Heer. Fl. Tert. Helv., vol. ii, p. 77, pl. lxxxix, f. 16, 17; xc, f. 17, 20; xcvii, f. 1, 1856; Lx., Cret. and Tert. Fl., p. 250, pl. lviii, f. 2, 1883.

Miocene: Corral Hollow, California.

Laurus proteæfolia Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 393, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 342, pl. v, f. 1, 2, 1874 [1876]; Cret. and Tert. Fl., p. 52, pl. iii, f. 9, 10; xvi, f. 6, 1883.

Dakota group: Morrison, Colorado; Fort Harker, Kansas.

Laurus resurgens Sap. Études: Ann. sci. nat. Bot. 5th ser., vol. iv, p. 132, pl. vii, f. 9*a*, 9*b*, 1866; Ward, Bull. U. S. Geol. Surv., no. 37, p. 47, pl. xxiii, f. 7, 1887.

Fort Union group?: Bull Mountains, Montana.
Miocene: Corral Hollow, California.

Laurus salicifolia Lx. Cret. and Tert. Fl., p. 251, pl. lviii, f. 4, 5, 1883.

Miocene: Corral Hollow, Calfornia.

Laurus Schmidtiana Heer. Fl. Foss. Arct., vol. v, abt. ii, p. 50, pl. xv, f. 8; 1878; Lx., Bull. Mus. Comp. Zoöl., vol. xvi, p. 50, 1888.

Denver group: Golden, Colorado.

Laurus sessiliflora Lx.=**Malapœnna** sessiliflora.

Laurus socialis Lx. Tert. Fl., p. 213, pl. xxxvi, f. 1, 2, 3, 4, 7, 1878.

Eocene?: Lassen County, California.
Denver beds: Golden, Colorado.
Livingston beds: Bozeman coal field, Montana.
Eolignitic?: Cross Lake, Louisiana.
Laramie group: Evanston and Hodges Pass, Wyoming.

Laurus teliformis Lx. Fl. Dak. Gr., p. 94, pl. l, f. 9, 1892.

Dakota group: Kansas.

Laurus utahensis Lx. Tert. Fl., p. 216, pl. xxvi, f. 11, 1878.

Laramie group: Hodges Pass, Wyoming?; Cross Lake, Louisiana.
Eolignitic: Cross Lake, Louisiana.

Laurus Wardiana nom. nov.

Laurus ocoteoides Lx. Tert. Fl., p. 215, pl. xxxvi, f. 10, 1878. [Not Massalongo, 1858.]

Laramie group: Golden, Colorado.

Laurus sp., Lx. Rept. on Clays in N. J., p. 29, 1878.

Amboy clay: Sayreville, New Jersey.

Laurus sp., Hollick. Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Miocene?: Bridgeton, New Jersey.

Laurus sp. Kn. In Vaughan, Am. Geol., vol. xvi, p. 308, 1895.
Eolignitic: Old Port Caddo Landing, Harrison County, Texas.

LEGUMINOSITES Bowerbank. Hist. Foss. Fr. and Seeds Lond. Clay, p. 124, 1840.

Leguminosites alternans Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 388, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 315, 1874 [1876]; Cret. and Tert. Fl., p. 202, 1883.
Green River group: Mouth White River.

Leguminosites? arachioides Lx. Tert. Fl., p. 301, pl. lix, f. 13, 14, 1878; Dn., Geol. Surv. Canada, Rept. of Prog. for 1877–78, p. 186 *b*, 1878.
Carpolithes arachioides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 403, 1872 [1873].
Fort Union group?: Clear Creek, Montana.
Denver group: Middle Park, Colorado.
Laramie group?: Evanston, Wyoming.

Leguminosites atanensis Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 119, pl. xxxiv, f. 6, 1874; Newby., Fl. Amboy Clays, p. 97, pl. xlii, f. 40, 1895 [1896].
Amboy clay: New Jersey?

Leguminosites? borealis Dn. Trans. Roy. Soc. Canada, vol. vii, sec. iv, p. 72, pl. x, f. 7, 1889.
Miocene?: Mackenzie River.

Leguminosites cassioides Lx., 1878 = Leguminosites Lesquereuxiana.

Leguminosites constrictus Lx. Fl. Dak. Gr., p. 151, pl. xliv, f. 3, 1892.
Dakota group: Kansas.
Cretaceous?: Oak Neck, Long Island.

Leguminosites convolutus Lx. Fl. Dak. Gr., p. 151, pl. xliv, f. 4, 1892.
Dakota group: Kansas.
Cretaceous?: Glen Cove, Long Island.

Leguminosites coronilloides? Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 119, pl. xxxiv, f. 14, 1874; Lx., Fl. Dak. Gr., p. 149, pl. xiii, f. 10, 1892.
Dakota group: Kansas.
Amboy clay: New Jersey.

Leguminosites cultriformis Lx. Cret. and Tert. Fl., p. 86, pl. x, f. 4, 1883.
Dakota group: Locality not given.

Leguminosites dakotensis Lx. Fl. Dak. Gr., p. 150, pl. xxxviii, f. 5, 1892.
Dakota group: Kansas.

Leguminosites frigidus Heer. Fl. Foss. Arct., vol. vii, p. 44, pl. lxv, f. 13; lv, f. 21*a*, 22, 1883; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 34, pl. ii, f. 11, 1892.
Cretaceous: Staten Island.

Leguminosites hymenophyllus Lx. Fl. Dak. Gr., p. 152, pl. lv, f. 7–9; pl. lvi, f. 3, 1892.
Dakota group: Kansas.

Leguminosites insularis Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 103, pl. xliv, f. 6, 1882; Lx., Fl. Dak. Gr., p. 152, pl. liv, f. 4, 1892.
Dakota group: Kansas.

Leguminosites Lesquereuxiana nom. nov.
Leguminosites cassioides Lx*. Tert. Fl., p. 300, pl. lix, f. 1–4, 1878. [* L. cassioides Lx., 1878, preoccupied by L. cassioides Engl., 1870.]
Green River group: Green River Station, Wyoming.
Laramie group: Bozeman coal field, Montana.

Leguminosites Marcouanus Heer=Liriodendron primævum.

Leguminosites omphalobioides Lx. Fl. Dak. Gr., p. 149, pl. xxxviii, f. 4, 1892; Newby., Fl. Amboy Clays, p. 97, pl. xlii, f. 39, 1895 [1896].
Dakota group: Kansas.
Amboy clay: New Jersey.

Leguminosites phaseolites? Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 118, pl. xxxiv, f. 7–11, 1874; Lx., Fl. Dak. Gr., p. 153, pl. lv, f. 10, 1892.
Dakota group: Kansas.

Leguminosites pisiformis ? Heer. Fl. Tert. Helv., vol. iii, p. 129, pl. cxxxix, f. 37–39, 1859; Lx., Am. Journ. Sci., vol. xxxii, p. 361, 1861; Geol. Vt., vol. ii. p. 716, f. 152, 1861.
———: Brandon, Vermont.

Leguminosites podogonialis Lx. Fl. Dak. Gr., p. 148, pl. xiii, f. 11; pl. xxxviii, f. 16, 1892.
Dakota group: Kansas.

Leguminosites serrulatus Lx. Cret. and Tert. Fl., p. 202, pl. xxxix, f. 7, 8, 1883.
Green River group: Florissant, Colorado.

Leguminosites truncatus Kn. In Lesquereux, Fl. Dak. Gr., p. 150, pl. xxi, f. 7, 1892.
Dakota group: Kansas.

Leguminosites sp., Dn. = Leguminosites arachioides.

Leguminosites sp., Heer. Neue Denkschr., vol. xxi, p. 10, pl. ii, f. 8, 1865; Dn.
———: Burrard Inlet, British Columbia.

Leguminosites sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 418, 1873 [1874].
———: Elko Station, Nevada.

Leguminosites sp., Lx. Cret. and Tert. Fl., p. 203, pl. xxxix, f. 16, 17, 1883.
Green River group: Florissant, Colorado.

Leguminosites sp., Lx. Proc. U. S. Nat. Mus., vol. x, p. 43, 1887.
——: Upper Kanab Valley, Utah.

Leguminosites sp., Lx. In Diller, Eighth Ann. Rept. U. S. Geol. Surv., p. 420, 1889.
Miocene?: Lassen County, California.

Leguminosites sp., Lx. Geol. and Nat. Hist. Surv. Minn., vol. iii, p. 21, 1893.
Dakota group: Goodhue Township, Minnesota.

Leguminosites sp., Lx. Proc. U. S. Nat. Mus. vol. xi, p. 30, 1888.
Eocene?: Lassen County, California.

LEMNA Linnæus. Syst., ed. i, 1735.

Lemna ? bullata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 363, 1875 [1876].
Laramie group: Point of Rocks, Wyoming.

Lemna penicillata Lx. Cret. and Tert. Fl., p. 143, pl. xxiii, f. 8, 1883.
Green River group: Florissant, Colorado.

Lemna scutata Dn. Rept. on Geol. 49th Parallel, Appen. A, p. 329, pl. xvi, f. 5, 6, 1875; Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 23, pl. i, f. 6, 1886 [1887].
Fort Union group: Burns's Ranch, Montana.
Lignitic Tertiary: Near forty-ninth parallel.
Montana group: Point of Rocks, Wyoming.
Laramie group: Wood Mountain, Pincher Creek, British Columbia.

LEPTOSTROBUS Heer. Fl. Foss. Arct., vol. iv, abt. ii: Mém. Acad. Imp. Sci. St. P., 7th ser., vol. xxii, no. 12, p. 72, 1876.

Leptostrobus foliosus Font. Potomac Fl., p. 230, pl. ci, f. 4; ciii, f. 5; civ, f. 1, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

Leptostrobus longifolius Font. Potomac Fl., p. 228, pl. ci, f. 2, 3; cii, f. 1–4; ciii, f. 6–12; civ, f. 6, 1889.
Potomac formation: Fredericksburg, near Brooke, near Potomac Run, and near Dutch Gap Canal, Virginia.
Kootanie: Anthracite and Canmore, British Columbia.

Leptostrobus ? multiflorus Font. Potomac Fl., p. 230, pl. clxv, f. 6, 1889.
Potomac formation: near Brooke, Virginia.

Leptostrobus ? seeds of, sp., Font. Potomac Fl., p. 332, pl. cxxxvi, f. 11, 1889.
Potomac formation: Kankeys, Virginia.

Leptostrobus ? seeds of, (*a*) sp., Font. Potomac Fl., p. 231, pl. cxxxv, f. 6, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Leptostrobus ? seeds of, (*b*) sp., Font. Potomac Fl., p. 231, pl. cxxxvi, f. 10, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

LEUCOTHOE D. Don. In Edinb. N. Phil. Journ., vol. xvii, p. 159, 1834.

Leucothoë racemosa (L.) A. Gray. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Miocene?: Bridgeton, New Jersey.

Libocedrus cretacea Heer=Thuja cretacea.

Lindera=Benzoin.

Lindera Masoni Lx.=Benzoin Masoni.

Lindera venusta Lx=Benzoin venusta.

LIQUIDAMBAR Linnæus. Hort. Cliff, p. 486, 1737.

Liquidambar californicum Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 14, pl. vi, f. 7*c*; pl. vii, f. 3, 6, 1878.
Miocene: Chalk Bluffs, California.

Liquidambar europæum Al. Br. In Buckl. Geol., vol. i, p. 115, 1836? Lx., Cret. and Tert. Fl., p. 159, pl. xxxii, f. 1, 1883.
Miocene: John Day Valley, Oregon.
Green River group: Florissant, Colorado.
Eocene?: Port Graham, Alaska.

Liquidambar europæum Al. Br., Lesquereux, 1888=Liquidambar styraciflua L.

Liquidambar gracilis Lx.=Aralia? gracilis.

Liquidambar integrifolius Lx. Am. Journ. Sci., vol. xlvi, p. 93, 1868; Cret. Fl., p. 56, pl. ii, f. 1-3; xxiv, f. 2; xxix, f. 8, 1874.
Dakota group: Salina, Kansas.
Mill Creek series: Mill Creek.

Liquidambar protensum Ung. Steiermärk. Zeitschr., n. Folge, ix Jahrg., p. 59 [36], 1848; Gen. et Sp. Pl. Foss., p. 415, 1850; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 13, pl. viii, f. 3, 1888.
Miocene: John Day Valley, Oregon.

Liquidambar styraciflua L. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892; Kn., Am. Geol., vol. xviii, p. 371, 1896.
Liquidambar europæum Al. Br. Lesquereux, Proc. U. S. Nat. Mus., vol. xi, p. 36, 1888.
Miocene?: Bridgeton, New Jersey.
Glacial: Morgantown, West Virginia.

LIRIODENDRON Linnæus. Spec. Pl., p. 535, 1753.

Liriodendron acuminatum Lx. Bull. Mus. Comp. Zoöl. Camb., vol. vii, p. 227, 1881; Lx., Fl. Dak. Gr., p. 207, pl. xxvii, f. 2, 3, 1892.
Dakota group: Kansas.

Liriodendron acuminatum bilobatum Lx. Fl. Dak. Gr., p. 207, pl. xxviii, f. 4, 1892.
Dakota group: Kansas.

Liriodendron alatum Newby. MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, no. 11, p. 467, pl. 220, 221, 1894.
Laramie group: Walsenburg, Colorado.

Liriodendron cruciforme Lx.=L. giganteum cruciforme.

Liriodendron giganteum Lx. Am. Journ. Sci., vol. xlvi, p. 99, 1868; Cret. Fl., p. 93, pl. xxii, f. 2, 1874.

Dakota group: Fort Harker, Kansas.

Liriodendron giganteum cruciforme Lx. Fl. Dak. Gr., p. 206, pl. xxviii, f. 1, 2, 1892.

Liriodendron cruciforme Lx. Bull. Mus. Comp. Zoöl. Camb., vol. vii, p. 227, 1881.

Dakota group: Kansas.

Liriodendron intermedium Lx. Am. Journ. Sci., vol. xlvi, p. 99, 1868; Fl. Dak. Gr., p. 207, pl. xxv, f. 1, 1892.

Dakota group: Southern Nebraska; Kansas.

Liriodendron laramiense Ward. Bull. U. S. Geol. Surv., no. 37, p. 102, pl. xlviii, f. 2, 1887.

Montana formation: Point of Rocks, Wyoming.

Liriodendron oblongifolium Newby. Bull. Torr. Bot. Club, vol. xiv, no. 1, p. 5, pl. lxi, f. 1, 1887; Hollick, op. cit., vol. xxi, p. 62, pl. 179, f. 3, 1894.

Amboy clay: Woodbridge, New Jersey.

Cretaceous: Glen Cove, Long Island.

Liriodendron Meekii Heer. Proc. Phila. Acad. Sci., vol. x, p. 265, 1858; Phyll. Crét. d. Nebr., p. 21, pl. iv, f. 3, 4, 1866; Fl. Dak. Gr., p. 205, pl. xxviii, f. 5, 6, 1892.

Dakota group: Mouth of Big Sioux, Nebraska.

Liriodendron Meekii var. Marcouana Heer=Liriodendron primævum.

Liriodendron Meekii var. mucronulata Heer=Liriodendron primævum.

Liriodendron Meekii var. obcordata Heer=Liriodendron primævum.

Liriodendron pinnatifidum Lx. Bull. Mus. Comp. Zoöl. Camb., vol. vii, p. 227, 1881; Fl. Dak. Gr., p. 209, pl. xxvii, f. 4, 5, 1892.

Dakota group: Kansas.

Liriodendron prætulipiferum Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 63, pl. viii, f. 27, 1893 [1894].

Upper Cretaceous: Nanaimo, Vancouver Island.

Liriodendron primævum Newby. Later Extinct Floras, p. 12, 1868; Lx., Fl. Dak. Gr., p. 203, pl. xxiv, f. 4; xxvi, f. 1–4, 1892.

Leguminosites Marcouanus Heer. Proc. Phil. Acad. Sci., vol. x, p. 265, 1858.

Bumelia Marcouana (Heer) Lx. Cret. Fl., p. 90, pl. xxviii, f. 2, 1874.

Phyllites obcordatus Heer. Proc. Phil. Acad. Sci., vol. x, p. 266, 1858.

Liriodendron Meekii var. Marcouana Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 88, 1882.

Liriodendron Meekii var. obcordata Heer. Op. cit., p. 88, 1882.

Liriodendron Meekii var. mucronulata Heer. Op. cit., p. 88, 1882.

Phyllites cotinus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 364, 1874 [1876].

Dakota group: Kansas and Nebraska.

Cretaceous: Staten Island, Long Island, New York.

Liriodendron quercifolium Newby. Bull. Torr. Bot. Club, vol. xiv, p. 6, pl. lxii, f. 1, 1887; Fl. Amboy Clays, p. 81, pl. li, f. 1–6, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Liriodendron semialatum Lx. Bull. Mus. Comp. Zoöl. Camb., vol. vii, p. 227, 1881; Fl. Dak. Gr., p. 204, pl. xxv, f. 2–4; pl. xxix, f. 3, 1892.
Dakota group: Kansas.

Liriodendron simplex Newby. = Liriodendropsis simplex + L. angustifolia.

Liriodendron Snowii Lx. Fl. Dak. Gr., p. 209, pl. xxix, f. 1, 2, 1892.
Dakota group: Kansas.

Liriodendron succedens Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 62, pl. viii, f. 26, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island.

Liriodendron Wellingtonii Lx. Fl. Dak. Gr., p. 208, pl. xxviii, f. 3, 1892.
Dakota group: Kansas.

Liriodendron sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 298, 1871 [1872]. [Not afterwards referred to by author.]
Laramie group?: Six miles above Spring Canyon, Montana.

LIRIODENDROPIS Newberry. Fl. Amboy Clays, p. 82, 1895 [1896].

Liriodendropsis angustifolia Newby. Fl. Amboy Clays, p. 84, pl. liii, f. 8, 1895 [1896].
Liriodendron simplex Newby., in part. Bull. Torr. Bot. Club, vol. xiv, p. 6, pl. lxii, f. 4, 1887.
Amboy clay: New Jersey.
Cretaceous: Marthas Vineyard.

Liriodendropsis simplex Newby. Fl. Amboy Clays, p. 83, pl. xix, f. 2, 3; liii, f. 1–4, 7, 1895 [1896].
Liriodendron simplex Newby., in part. Bull. Torr. Bot. Club, vol. xiv, p. 6, pl. lxii, f. 2, 3, 1887.
Amboy clay: Woodbridge, New Jersey.
Cretaceous: Glen Cove, Long Island; Marthas Vineyard.

LIRIOPHYLLUM Lesquereux. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 482, 1876 [1878].

Liriophyllum Beckwithii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 482, 1876 [1878]; Cret. and Tert. Fl., p. 76, pl. x, f. 1, 1883; Fl. Dak. Gr., p. 210, 1892.
Dakota group: Morrison, Colorado.

Liriophyllum obcordatum Lx. Cret. and Tert. Fl., p. 77, 1883; Fl. Dak. Gr., p. 210, pl. xxviii, f. 7, 1892.
Dakota group: Morrison, Colorado.

Liriophyllum populoides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 483, 1876 [1878]; Crét. and Tert. Fl., p. 76, pl. xi, f. 1, 2, 1883.
Dakota group: Colorado and Kansas.

Litsea = Malapoenna.

Litsæa carbonensis Ward = Malapoenna carbonensis.

Litsea cretacea Lx. = Malapoenna cretacea.

Litsea falcifolia Lx.=Malapoenna falcifolia.
Litsea Weediana Kn.=Malapoenna Weediana.
Litsea sp., Kn.=Malapoenna sp.

LOMATIA Robert Brown. Trans. Linn. Soc. Lond., vol. x, p. 199, 1810.

Lomatia abbreviata Lx. Cret. and Tert. Fl., p. 167, xliii, f. 17, 1883.
Green River group: Florissant, Colorado.

Lomatia acutiloba Lx. Cret. and Tert. Fl., p. 167, pl. xliii, f. 11-16, 20, 1883.
Green River group: Florissant, Colorado.

Lomatia hakeæfolia Lx. Cret. and Tert. Fl., p. 166, pl. xxxii, f. 19, 1883.
Green River group: Florissant, Colorado.

Lomatia interrupta Lx. Cret. and Tert. Fl., p. 167, pl. xliii, f. 18, 19, 1883.
Green River group: Florissant, Colorado.

Lomatia microphylla Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 389, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 315, 1874 [1876]; Tert. Fl., p. 211, pl. lxv, f. 14, 15, 1878.
Green River group: Mouth of White River.

Lomatia ? Saportanea Lx. Ann. Rept. U. S. Geo. and Geogr. Surv. Terr., p. 346, 1874 [1876]; Cret. and Tert. Fl., p. 51, pl. iii, f. 8, 1883.
Todea ? Saportanea Lx. Cret. Fl., p. 48, pl. xxix, f. 1-4, 1874.
Dakota group: Kansas.

Lomatia ? Saportanea var. longifolia Lx. Cret. and Tert. Fl., p. 52, 1883.
Dakota group: Morrison, Colorado.

Lomatia spinosa Lx. Cret. and Tert. Fl., p. 166, pl. xliii, f. 1, 1883.
Green River group: Florissant, Colorado.
Eocene ?: Similkameen Valley, British Columbia.

Lomatia terminalis Lx. Cret. and Tert. Fl., p. 166, pl. xliii, f. 2-7, 1883.
Green River group: Florissant, Colorado.

Lomatia tripartita Lx. Cret. and Tert. Fl., p. 166, pl. xliii, f. 8-10, 1883.
Green River group: Florissant, Colorado.

LONCHOCARPUS Humbolt Bonpland and Kunth. Nov. Gen. et Sp., vol. vi, p. 383, 1823.

Lonchocarpus novæ-cæsareæ Hollick. Bull. Torr. Bot. Club, vol. xxiii, p. 49, pl. cclix, f. 6-8, 1896.
Miocene ?: Bridgeton, New Jersey.

LYCOPODIUM (Ruppino) Linnæus. Gen. Pl., p. 323, 1737.

Lycopodium Lesquereuxii Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Selaginella falcata Lx. Ex. p. Lx., Tert. Fl., p. 46, pl. lxiv, f. 13, 13a [non pl. lxi, f. 12-15], 1878.
Montana formation: Point of Rocks, Wyoming.

Lycopodium prominens Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 409, 1873 [1874]; Tert. Fl., p. 45, pl. v, f. 13–13*b*, 1878.

Green River group: Elko Station, Nevada.

Lycopodium sp., Hinde. Canadian Journal [Can. Institute], vol. xv, p. 399, 1878.

Interglacial: Scarboro Heights, Ontario.

Lycopodium sp. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 62, 1896.

Pleistocene: Long Portage, Missinaibi River; Scarboro Heights, Ontario.

LYGODIUM Swartz. Schrad. Journ Bot., vol. ii, p. 106, 1800.

Lygodium compactum Lx. Am. Journ. Sci., vol. xvi, p. 206, 1868; Tert. Fl., p. 64, pl. v, f. 9, 1878.

Laramie group: Coal Creek, Colorado.

Lygodium Dentoni Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 383, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 309, 1874 [1876]; Tert. Fl., p. 63, pl. lxv, f. 12, 13, 1878.

Green River group: Mouth of White River into Green River.

Lygodium Marvinei Lx. Bull. U. S. Geogr. Surv. Terr., vol. i, p. 383, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 309, 1874 [1876]; Tert. Fl., p. 62, pl. v, f. 8, 1878.

———?: Eagle Junction.

Lygodium Kaulfusii Heer. Beiträge z. nähern Kennt. d. Sächs.-Thuring. Braunkohle, p. 409, pl. viii, f. 21, 1861.

Lygodium neuropteroides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 384, 1870 [1871]; Tert. Fl., p. 61, pl. v, f. 4–7; pl. vi, f. 1, 1878.

Green River group?: Barrell Springs, Wyoming.

Eocene?: Cherry and Crescent creeks, Oregon.

Eocene: Elk Creek, Yellowstone National Park; Wilkinson coal field, Washington; Cherry Creek, Oregon.

Lygodium neuropteroides Lx.=Lygodium Kaulfusii.

Lygodium trichomanoides Lx. Cret. Fl., p. 45, pl. i, f. 2, 1874.

Lygodium? sp., Lx. Am. Journ. Sci., vol. xlvi, p. 91, 1868.

Dakota group: Fort Harker, Kansas.

Lygodium? sp., Lx. [Am. Journ. Sci., xlvi, 91, 1868]=Lygodium trichomanoides.

MACCLINTOCKIA Heer. Fl. Foss. Arct., vol. i, p. 114, 1868.

Macclintockia cretacea Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 70, pl. xxxvi, f. 1*a*; pl. xxxvii, f. 2–4, 1882; Lx., Fl. Dak. Gr., p. 197, pl. lix, f. 4, 1892; Dn., Trans. Roy. Soc. Canada, vol. iii, p. 13, pl. iv, f. 3, 1885.

Dakota group: Kansas.

Mill Creek series: Mill Creek.

Macclintockia Lyallii Heer. Fl. Foss. Arct., vol. i, p. 115, pl. xv, f. 1*a*, 2; xvi, f. 7*a*, *b*; xvii, f. 2*a*, *b*; xlvii, f. 13; xlviii, f. 8, 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 400, 1872 [1873]. [Not afterwards mentioned by Lesquereux.]

———?: Black Buttes, Wyoming.

Macclintockia trinervis Heer. Fl. Foss. Arct., vol. i, p. 115, pl. xv, f. 7–9, 1868; Dn., Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 64, pl. x, f. 38, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island.

Maclura auriantiaca Nutt. = Toxylon pomiferum.

MACREIGHTIA Alphonse de Candolle. Prod., vol. viii, p. 220, 1844.

Macreightia crassa Lx. Cret. and Tert. Fl., p. 175, pl. xxxiv, f. 16, 17, 1883.
Green River group: Florissant, Colorado.

Macrospores ? sp., Font. Potomac Fl., p. 274, pl. cxxxvi, 1889.
Potomac formation: Dutch Gap Canal, Virginia.

MACROTÆNIOPTERIS Schimper. Pal. Vég., vol. i, p. 610, 1869.

Macrotæniopteris vancouverensis Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 55, pl. v, f. 1–3, 1893 [1894].
Upper Cretaceous: Nanaimo.

MAGNOLIA Linnæus. Syst., ed. i, 1735.

Magnolia acuminata L. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.
Miocene?: Bridgeton, New Jersey.

Magnolia alternans Heer. Phyll. Crét. d. Nebr., p. 20, pl. iii, f. 2–4; pl. iv, f. 1, 2, 1866; Cret. Fl., p. 92, pl. xviii, f. 4, 1874; Lx., Fl. Dak. Gr., p. 201, pl. xxxiv, f. 11, 1892; Newby., Fl. Amboy Clays, p. 73, pl. lv, f. 1, 2, 4, 6, 1895 [1896].
Dakota group: Nebraska, Kansas, and Minnesota.
Amboy clay: Woodbridge and Sayreville, New Jersey.

Magnolia alternans Heer, Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 300, 1871 [1872]. [Not same as Dakota group plant; affinity not stated by Lesquereux and apparently not afterwards mentioned.]
Laramie group?: Three miles above Spring Canyon, Montana.

Magnolia amplifolia Heer. Kreidefl. v. Moletein in Mähren, Neue Denkschr. Schw. Ges., vol. xxiii, p. 21, pl. viii, f. 2; ix, f. 1, 1869; Lx., Fl. Dak. Gr., p. 200, pl. xxiv, f. 3, 1892.
Dakota group: Kansas.

Magnolia angustifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 513 1882 [1883].
Magnolia attenuata Web. in Lx. Tert. Fl., p. 250, pl. xlv, f. 6, 1878.
Laramie group: Fishers Peak, New Mexico.

Magnolia attenuata O. Web. Lesquereux, 1878 = Magnolia angustifolia.

Magnolia auriculata Newby. MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 61, pl. clxxix, f. 6, 7, 1894; Newby., Fl. Amboy Clays, p. 75, pl. xli, f. 13; lviii, f. 1–11, 1895 [1896].
Cretaceous: Glen Cove, Long Island.
Amboy clay: Woodbridge, New Jersey.

Magnolia Boulayana Lx. Fl. Dak. Gr., p. 202, pl. lx, f. 2, 1892.
Dakota group: Kansas.

Magnolia californica Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 25, pl. vi, f. 5–7, 1878.
Miocene: Chalk Bluffs and Contra Costa, California.
Eocene: Lassen County, California.

Magnolia Capellinii Heer. Phyll. Crét. d. Nebr., p. 21, pl. iii, f. 5, 6, 1866; Lx., Rept. on Clays in N. J., p. 29, 1878; Fl. Dak. Gr., p. 203, pl. lxvi, f. 1, 1892.
Dakota group: Tekamah, Nebraska.
Amboy clay: Sayreville, New Jersey?
Cretaceous: Glen Cove, Long Island; Marthas Vineyard; Port McNeill, Vancouver Island.

Magnolia cordifolia Lx. Trans. Am. Phil. Soc., vol. xiii, p. 422, pl. xxii, f. 1, 2, 1869.
Eolignitic: Mississippi.

Magnolia ensifolia Lx. = Celastrophyllum ensifolium.

Magnolia glauca L. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.
Miocene?: Bridgeton, New Jersey.

Magnolia glaucoides Newby. MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 60, pl. clxxv, f. 1, 7, 1894; Newby., Fl. Amboy Clays, p. 74, pl. lvii, f. 1–4, 1895 [1896].
Cretaceous: Sea Cliff, Long Island; Marthas Vineyard.
Amboy clay: Woodbridge, New Jersey.

Magnolia Hilgardiana Lx. Second Rept. Geol. Recon. Arkansas, p. 319, pl. vi, f. 1, 1860; Trans. Am. Phil. Soc., vol. xiii, p, 421, pl. xxi, f. 1, 1869; Tert. Fl., p. 249, pl. xliv, f. 4, 1878.
Eolignitic: Mississippi.
Eocene: Lassen County, California.
Fort Union group: Yellowstone Valley, Montana.
Laramie group: Fishers Peak, New Mexico.

Magnolia Inglefieldi Heer. Fl. Foss. Arct., vol. i, p. 120, pl. iii, f. *5c*; xvi, f. 5, 6, *8b*; xviii, f. 1–3, 1868; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 13, 1888.
Miocene: John Day Valley, Oregon.
Eocene?: Lassen County, California.

Magnolia Inglefeldi Heer. Lesquereux, Hayden's Ann. Rept., 1872, p. 396 = Magnolia tenuinervis.

Magnolia Isbergiana Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 91, pl. xxxvi, f. 3, 1882; Hollick, Bull. Torr. Bot. Club., vol. xxi, p. 60, 1894.
Cretaceous: Glen Cove, Long Island.

Magnolia Lacoeana Lx. Fl. Dak. Gr., p. 201, pl. lx, f. 1, 1892; Newby., Fl. Amboy Clays, p. 73, pl. lv, f. 1, 2, 1895 [1896].
Dakota group: Kansas.
Amboy clay: Woodbridge, New Jersey.

Magnolia lanceolata Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 24, pl. vi, f. 4, 1878.
Miocene: Chalk Bluffs, California; John Day Valley, Oregon.
Miocene?: Cherry Creek, Oregon.

Magnolia laurifolia Lx. Trans. Am. Phil. Soc., vol. xiii, p. 421, pl. xx, f. 2, 3, 1869.
Eolignitic: Mississippi; Cross Lake and McLees, Louisiana.

Magnolia Lesleyana Lx. Trans. Am. Phil. Soc., vol. xiii, p. 421, pl. xxi, f. 1, 2, 1869; Tert. Fl., p. 248, pl. xliv, f. 1-3, 1878.
Terminalia Radobojensis Heer. Lx., Ann. Rept., op. cit., 1871, suppl., p. 15, 1871 [1872].
Eolignitic: Mississippi.
Laramie group: Raton Mountains, New Mexico.
Laramie group?: Evanston, Wyoming?

Magnolia longifolia Newby. In MSS. Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 36, pl. iii, f. 9, 1892; Newby., Fl. Amboy Clays, p. 76, pl. lv, f. 3, 5; lvi, f. 1-4, 1895 [1896].
Cretaceous: Staten Island; Marthas Vineyard.
Amboy clay: Woodbridge, New Jersey.

Magnolia longipes Newby. In MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 60, pl. clxxviii, f. 3, 1894; Newby., Fl. Amboy Clays, p. 76, pl. liv, f. 1-3, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.
Cretaceous: Glen Cove, Dosoris Island, Long Island.

Magnolia magnifica Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 22, pl. iii, f. 11, 1882 [1883].
Mill Creek series: Coal Brook, Northwest Territory; Mill Creek.

Magnolia Nordenskiöldi Heer. Fl. Foss. Arct., vol. iv, abt. i, p. 82, pl. xxi, f. 3; xxx, f. 1, 1877; Lx., Proc. U. S. Nat. Mus., vol. v, p. 448, 1882 [1883].
Eocene?: Chignik Bay, Alaska.

Magnolia obovata Newby. Later Extinct Floras, p. 15, 1868.
Dakota group: Blackbird Hill, Nebraska.

Magnolia obtusata Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 90, pl. xv, f. 12; pl. xxi, f. 3, 1882; Lx., Fl. Dak. Gr., p. 201, pl. lx, f. 5, 6, 1892.
Dakota group: Kansas.

Magnolia occidentalis Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 63, pl. x, f. 36, 1893 [1894].
Upper Cretaceous: Nanaimo, Vancouver Island.

Magnolia ovalis Lx. Trans. Am. Phil. Soc., vol. xiii, p. 422, pl. xxi, f. 3, 4, 1869.
Eolignitic: Mississippi.

Magnolia pseudoacuminata Lx. Fl. Dak. Gr., p. 199, pl. xxiv, f. 2, 1892.
Dakota group: Kansas.

Magnolia pulchra Ward. Bull. U. S. Geol. Surv., no. 37, p. 103, pl. xlviii, f. 3, 4, 1887.

Montana formation: Point of Rocks, Wyoming.

Magnolia rotundifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 513, 1882 [1883].

Laramie group: Fishers Peak, New Mexico.

Magnolia speciosa Heer. Neue Denkschr. Schw. Gesel., vol. xxiii, p. 20, pl. vi, fig. 1; ix, f. 2; x, f. 1, 1869; Lx., Cret. and Tert. Fl., p. 72, 1874; Fl. Dak. Gr., p. 202, pl. lx, f. 3, 4, 1892.

Dakota group: Morrison, Colorado.

Cretaceous: Glen Cove, Long Island; Marthas Vineyard, Massachusetts.

Magnolia tenuifolia Lx. Am. Journ. Sci., vol. xlvi, p. 100, 1868; Cret. Fl., p. 92, pl. xxi, f. 1, 1874; Fl. Dak. Gr., p. 198, pl. xxiv, f. 1, 1872.

Dakota group: Decatur, Nebraska; Kansas; Peace River, Northwest Territory.

Magnolia tenuinervis Lx. Am. Journ. Sci., vol. xlv, p. 207, 1868; Tert. Fl., p. 249, pl. xliv, f. 5, 6; pl. xlv, f. 1–5, 1878.

Magnolia Inglefeldi? Heer. Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1872 [1873].

Denver group: Golden, Colorado.

Laramie group: Black Buttes and Hogdes Pass, Wyoming.

Laramie group?: Coalville, Utah?

Magnolia Van Ingeni Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 61, pl. clxxv, f. 6, 1894.

Cretaceous: Sea Cliff, Long Island.

Magnolia woodbridgensis Hollick in Newby. Fl. Amboy Clays, p. 74, pl. xxxvi, f. 11; lvii, f. 5–7, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Magnolia sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 287, 1871 [1872]. [Not afterwards referred to by Lesquereux.]

Eocene?: Washakie Station, Wyoming.

Magnolia sp., Lx. Cret. and Tert. Fl., p. 73, pl. xi, f. 6, 1883.

Dakota group: Morrison, Colorado.

Magnolia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 145, 1897.

Fort Union group: Black Buttes, Wyoming.

Magnolia ? sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 89, f. (in text) 29, 1890.

Eocene?: Similkameen Valley, British Columbia.

MAJANTHEMOPHYLLUM O. Weber. Tertiärfl. d. Niederrh. Braunkohlenf.: Palæontographica, vol. ii, p. 156 [reprint 42], 1852.

Majanthemophyllum pusillum Heer. Fl. Foss. Arct., vol. vii, p. 18, pl. lv, f. 17, 1883; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 36, pl. i, f. 7, 1892.

Cretaceous: Staten Island.

MALAPOENNA Adanson. Fam. Pl., vol. ii, p. 447, 1763.

Malapoenna carbonensis (Ward) n. comb.

Litsæa carbonensis Ward. Bull. U. S. Geol. Surv., no. 37, p. 48, pl. xxiv, f. 1, 1887.

Laramie group: Carbon, Wyoming.

Malapoenna cretacea (Lx.) n. comb.

Litsea cretacea Lx. Fl. Dak. Gr., p. 96, pl. xv, f. 2, 1892.

Dakota group: Kansas.

Malapoenna falcifolia (Lx.) n. comb.

Litsea falcifolia Lx. Fl. Dak. Gr., p. 97, pl. xi, f. 5, 1892.

Dakota group: Kansas.

Malapoenna sessiliflora (Lx.) n. comb.

Laurus sessiliflora Lx. Ann. Rept., op. cit., p. 407, 1873 [1874].

Tetranthera sessiliflora Lx. Ex. p. Tert. Fl., p. 217, pl. xxxiv, f. 1 c, 1 *d;* pl. xxxv, f. 8 [non f. 9], 1878.

——— : Evanston, Wyoming.

Malapoenna Weediana (Kn.) n. comb.

Litsea Weediana Kn. Bull. U. S. Geol. Surv., no. 105, p. 55, 1893.

Tetranthera sessiliflora Lx. Ex. p. Tert. Fl., p. 217, pl. xxxv, f. 9, 1878.

Livingston beds: Bozeman coal field, Montana.

Malapoenna sp.

Litsea sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.

Montana formation: Point of Rocks, Wyoming.

MANICARIA Gærtner. De Fruct., vol. ii, p. 468, 1802.

Manicaria Haydeni Newby. Proc. U. S. Nat. Mus., vol. v, p. 504, 1882 [1883].

Eocene: Green River, Wyoming.

Manicaria sp., Dn. Trans. Roy. Soc. Canada, 2d ser., vol. i, sec. iv, p. 143, 1895–96.

Eocene: Burrards Inlet, Vancouver, British Columbia.

MARSILEA (Micheli) Linnæus. Gen. Pl., p. 326, 1737.

Marsilea attenuata (Lx.) Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 256, pl. ccv, f. 10, 1894.

Salvinia attenuata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 377, 1875; Ann. Rept U. S. Geol. and Geogr. Surv. Terr., p. 296, 1874 [1876]; Tert. Fl., p. 65, pl. lxiv, f. 14, 14*a*, 1878.

Laramie group: Point of Rocks, Wyoming.

Marsilea Bendirei Ward = Porana Bendirei.

MENISPERMITES Lesquereux. Cret. Fl., p. 94, 1874.

Menispermites acerifolia Lx. = Menispermites menispermifolia.

Menispermites acutilobus Lx. Cret and Tert. Fl., p. 78, pl. xiv, f. 2, 1883.

Dakota group: Kansas.

Menispermites borealis Heer ? Fl. Foss. Arct., vol. vi, abt. ii, p. 91, pl. xxxix, f. 2, 1882; Newby., Fl. Amboy Clays, p. 84, pl. l, f. 1–6, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Menispermites Brysoniana Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 59, pl. clxx, f. 10, 1894.

Cretaceous: Glen Cove, Long Island.

Menispermites cyclophyllus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 358, pl. vi, f. 4, 1874 [1876].

Dakota group: Kansas.

Menispermites grandis Lx. Cret. and Tert. Fl., p. 80, pl. xv, f. 1, 2, 1883.

Dakota group: Kansas.

Menispermites menispermifolius (Lx.) n. comb.

Acerites menispermifolius Lx. Am. Journ. Sci., vol. xlvi, p. 101, 1868.
Menispermites acerifolia Lx. Cret. Fl., p. 96, pl. xx, f, 2; 3, 1874.

Dakota group: Decatur, Nebraska.

Menispermites obtusiloba Lx. Cret. Fl., p. 94, pl. xxv, f. 1–2; xxvi, f. 3, 1874; Cret. and Tert. Fl., p. 78, 1883.

Menispermites obtusiloba var.? Cret. Fl., p. 95, pl. xxii, f. 1, 1874.
Dombeyopsis obtusiloba Lx. Am. Journ. Sci., vol. xlvi, p. 100, 1868.

Dakota group: Salina River, Kansas.

Menispermites ovalis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 398, 1875 [1876]; Ann. Rept. U. S. Geol. and Geog. Surv. Terr., p. 357, pl. v, f. 4, 1874 [1876].

Dakota group: Kansas.

Menispermites populifolius Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 357, pl. v, f. 3, 1874 [1876]; Cret. and Tert. Fl., p. 79, pl. iv, f. 4, 1883.

Dakota group: Kansas.

Menispermites reniformis Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 23, pl. iii, f. 12, 1882 [1883].

———: Coal Brook, Northwest Territory.

Menispermites rugosus Lx. Fl. Dak. Gr., p. 196, pl. xxix, f. 7, 1892.

Dakota group: Kansas.

Menispermites salinensis Lx. = Menispermites salinæ.

Menispermites salinæ (Lx.) n. comb.

Acer obtusilobium? Ung. Lesquereux, Am. Journ. Sci., vol. xlvi, p. 100, 1868.
Populites salinæ Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 423, 1872 [1873].
Menispermites salinensis Lx. Cret. Fl., p. 95, pl. xx, f. 1, 4, 1874.

Dakota group: Salina River, Kansas.

Menispermites tenuinervis Font. Potomac Fl., p. 322, pl. clxxii, f. 8, 1889.

Potomac formation: Baltimore, Maryland.

Menispermites virginiensis Font. Potomac Fl., p. 321, pl. clxi, f. 1, 2, 1889.

Potomac formation: Near Brooke, Virginia.

Menispermites Wardianus Hollick in Newby. Fl. Amboy Clays, p. 85, pl. xxix, f. 9, 11, 1895 [1896].

Amboy clay: No locality.

Menispermites sp., Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 62, pl. xi, f. 50, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver Island.

Menispermites sp. Kn. Bull. Geol. Soc. Am., vol. viii, p. 131, 1897.

Laramie group: Lance Creek, Converse County, Wyoming.

MENISPERMUM Linnæus. Syst., ed. i, 1735.

MENYANTHES Linnæus. Syst., ed. i, 1735.

Menyanthes trifoliata L. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 327, 1890.

Pleistocene: Montreal, Canada.

MEZONEURUM Desfontaines. Mem. Mus. Paris, vol. iv, p. 245, 1818.

Mezoneurum bridgetonense Hollick.

Mezoneurum bridgetonense Hollick. Bull. Torr. Bot. Club, vol. xxiii, p. 49, pl. colviii, f. 1-7, 1896.

Pleistocene?: Bridgeton, New Jersey.

MICROZAMIA Corda in Reuss. Verst. d. Böhm. Kreidef., abt. ii, p. 85, 1846.

Microzamia gibba (Reuss) Corda in Reuss. Verst. d. Böhm. Kreidef. abt. ii, p. 85, 1846; Newby., Fl. Amboy Clays, p. 45, pl. xii, f. 6, 7, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

MIMOSITES Bowerbank. Hist. Foss. Fr. and Seeds London clay, p. 140, 1840.

Mimosites linearis* (Lx.) n. comb.

Mimosites linearifolius Lx. Tert. Fl., p. 300, pl. lix, f. 7, 1878.

Cæsalpinia? linearis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 417, 1873 [1874].

[*Non M. linearis Engelh., 1894.]

Green River group: Florissant, Colorado.

MONIMOSOPS Saporta. Prod. Fl. Foss. d. Sézanne: Mem. Soc. Geol. d. France, 2d ser., vol. vii, p. 361, 1868.

?**Monimiopsis amboræfolia** Sap. Foss. Fl. d. Sézanne, p. (73) 361, pl. (viii) xxix, f. 13, 1868; Ward, Bull. U. S. Geol. Surv. no. 37, p. 51, pl. xxv, f. 2, 1887.

Fort Union group: Seven-Mile Creek, Montana.

?**Monimiopsis fraterna** Sap. Fl. Foss. d. Sézanne, p. (74) 362, pl. (viii) xxix, f. 14, 1868; Ward, Bull. U. S. Geol. Surv. no. 37, p. 52, pl. xxv, f. 3, 1887.

Fort Union group: Seven-Mile Creek, Montana.

MORICONIA Debey and Ettingshausen. Urweltlichen Acrobryen v. Aachen: Denkschr. Wien. Akad., vol. xvii, p. 339 [59], 1859.

Moriconia cyclotoxon Deb. and Ett. Urweltlichen Acrobryen v. Aachen (Denkschr. Wien. Akad., vol. xvii, p. 239), p. 59, pl. vii, f. 23–27, 1859; Newby., Fl. Amboy Clays, p. 55, pl. x, f. 11–21, 1895 [1896].
Amboy clay: South Amboy, New Jersey.

MORUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Morus affinis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 11, 1871 [1872]. [Not afterwards mentioned by author.]
Laramie group ? : Evanston, Wyoming.

Morus sp., Hollick. Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Miocene?: Bridgeton, New Jersey.

Muscites Sternbergianus Dunk. = Sphenolepidium Sternbergianum.

MUSOPHYLLUM Göppert. Tertiärfl. d. Insel Java, p. 39, 1854.

Musophyllum complicatum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 418, 1873 [1874]; Tert. Fl., p. 96, pl. xv, f. 1–6, 1878.
Green River group?: Green River Station Wyoming?
Laramie group: Golden, Colorado.

MYRICA DeCandolle. Ex. Guill. in Dict. Class. Hist. Nat., vol. xi, pp. 378, 401, 1826.

Myrica acuminata Ung. Synop. Pl. Foss., p. 214, 1845; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 411, 1873 [1874]; Tert. Fl., p. 130, pl. xvii, f. 1–4, 1878.
Green River group: Florissant, Colorado; mouth of White River, Utah.

Myrica acuta Hollick in Newby. Fl. Amboy Clays, p. 65, pl. xlii, f. 35, 1895 [1896].
Amboy clay: No location.

Myrica alkalina Lx. Cret. and Tert. Fl., p. 149, pl. xlvA, f. 10–15, 1883.
Green River group: Alkali Station, Wyoming.

Myrica amaygdalina Sap. Ann. d. Sci. Nat., 5th ser., bot., vol. ix, p. 21 [153], pl. i, f. 8–10, 1867; Lx., Cret. and Tert. Fl., p. 147, pl. xxvi, f. 1–4, 1883.
Green River group: Florissant, Colorado.

Myrica ambigua Lx. = Celastrinites ambiguus.

Myrica aspera Lx. Fl. Dak. Gr., p. 66, pl. ii, f. 11, 1892.
Dakota group: Kansas.

Myrica banksiæfolia Ung. Synop. Pl. Foss., p. 214, 1845; Heer, Fl. Foss. Alask., p. 28, pl. ii, f. 11, 1869.
Eocene?: Port Graham, Alaska.

Myrica Bolanderi Lx. Tert. Fl., p. 133, pl. xvii, f. 17, 1878.

Ilex undulata* Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 416, 1873 [1874].

[*M. undulata. Preoccupied by M. undulata Heer, Fl. Tert. Helv., iii, p. 188, 1859.]

Green River group? : Locality unknown.

Myrica Brongniarti ? Ett. Tert. Fl., p. 135, pl. xvii, f. 15, 1878.

Myrica (Comptonia) Brongniarti ? Ett in Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 412, 1873 [1874].

Green River group: Elko Station, Nevada.

Myrica brookensis Font. Potomac Fl., p. 310, pl. cl, f. 11; pl. clvi, f. 10, 1889.

Potomac formation: Near Brooke, Virginia.

Myrica calicomæfolia Lx. = Myrica drymeja.

Myrica cinnamomifolia Newby. Fl. Amboy Clays, p. 64, pl. xxii, f. 9–14, 1895 [1896].

Amboy clay: Woodbridge, South Amboy, New Jersey.

Myrica Copiana Lx. Am. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 411, 1873 [1874]; Tert. Fl., p. 131, pl. xvii, f. 5, 1878.

Green River group: Florissant, Colorado.

Eolignitic: Wickliffe, Kentucky.

Myrica cretacea Lx. = Myrica dakotensis.

Myrica (Comptonia) cuspidata (Lx.) Dn. Trans. Roy. Soc. Canada 1890, vol. viii, p. 80, f. 9, 1890.

Comptonia cuspidata Lx. Proc. U. S. Nat. Mus., vol. v, p. 445, pl. vi, f. 10–12, 1882 [1883].

Eocene? : Unga Island, Alaska.

Myrica dakotensis* Lx. Cret. and Tert. Fl., p. 35, pl. iv, f. 9, 1883.

Myrica cretacea Lx. Bull. U. S. Geol. and Geogr. Surv, Terr., vol. i, p. 392, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 339, pl. iii, f. 4, 1874 [1876].

[*Myrica cretacea Lx. Preoccupied by M. cretacea Heer, Fl. Quedl.]

Dakota group: Fort Harker, Kansas.

Myrica Davisii Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 32, pl. ii, f. 3, 1892.

Cretaceous: Staten Island.

Myrica diversifolia Lx. = Cratægus flavescens.

Myrica drymeja (Lx.) n. comb.

Myrica callicomæfolia Lx. Cret. and Tert. Fl., p. 146, pl. xxvi, f. 5–14, 1883.
Callicoma microphylla Ett. Lx., Tert Fl., p. 246, pl. xliii, f. 2–4, 1878.
Rhus? drymeja Lx. Ann. Rept., op. cit., p. 416, 1873 [1874].

Green River group: Florissant, Colorado; Elko Station, Nevada.

Myrica elæanoides Lx. Proc. U. S. Nat. Mus., vol. xi, p. 12, pl. iv, f. 5, 1888.

Eolignitic: Wickliffe, Kentucky.

Myrica emarginata Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 66, pl. xli, f. 2, 1882; in Lx., Fl. Dak. Gr., p. 67, pl. xii, f. 1, 1892; Newby., Fl. Amboy Clays, p. 62, pl. xli, f. 10, 11, 1895 [1896].

Dakota group: Kansas.

Amboy clay: New Jersey?

Myrica fallax Lx. Cret. and Tert. Fl., p. 147, pl. xxxii, f. 11-16, 1883.
Green River group: Florissant, Colorado.

Myrica fenestrata Newby. Fl. Amboy Clays, p. 63, pl. xliii, f. 32, 1895 [1896].
Amboy clay: Sayreville, New Jersey.

Myrica grandifolia Hollick = Myrica Hollicki.

Myrica Hollicki Ward. Am. Journ. Sci., vol. xlv, p. 437, 1893.
Myrica grandifolia * Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 32, pl. iii, f. 1, 1892.
[* Preoccupied by M. grandifolia (Ung.) Schimp. Pal. Vég., vol. ii, p. 559, 1872.]
Cretaceous: Staten Island.

Myrica ? idahoensis Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 724, pl. xcix, f. 7, 1898.
Payette formation: Marsh, Idaho.

Myrica insignis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 312, 1874 [1876]; Tert. Fl., p. 135, pl. lxv, f. 7, 8, 1878.
Green River group: Florissant, Colorado.

Myrica lanceolata Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 724, pl. xcix, f. 5, 6, 1898.
Payette formation: Shafer Creek, Boise County, Idaho.

Myrica latiloba Heer, var. **acutiloba** Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 412, 1873 [1874]; Tert. Fl., p. 134, pl. xvii, f. 13, 1878.
Green River group: Florissant, Colorado.

Myrica Lessigiana Lx. = Artocarpus Lessigiana.

Myrica Lessigii Lx. = Artocarpus Lessigiana.

Myrica lignitum (Ung.) Sap. Étud.: Ann. sci. nat. Bot., 5th ser., vol. iv, p. 102, pl. 5, f. 10, 1866.
Dryandroides lignitum (Ung.) Ett. Lesquereux, Proc. U. S. Nat. Mus., vol. x, p. 41, 1887.
———: Deer Creek coal field, Arizona.

Myrica longa (Heer.) Lx. Fl. Dak. Gr., p. 67, pl. iii, f. 1-6, 1892.
Proteoides longus Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 110, pl. xxxi, f, 4, 5; xxix, f. 8*b*, 1874; Dn., Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 22, pl. ii, f. 8, 1882 [1883].
Dakota group: Kansas; Fork of Peace River, Northwest Territory.

Myrica Ludwigii Schimp. Pal. Vég., vol. ii, p. 545, 1872; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 385, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 311, 1874 [1876]; Tert. Fl., p. 133, pl. lxv, f. 9, 1878.
Green River group: Mouth of White River.

Myrica Newberryana Hollick in Newby. Fl. Amboy Clays, p. 63, pl. xliii, f. 5, 1895 [1896].
Amboy clay: South Amboy, New Jersey.

Myrica nigricans Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 6, 1871 [1872]; Tert. Fl., p. 132, pl. xvii, f. 9-12, 1878.
Green River group: Green River, Wyoming.

Myrica obliqua Kn. in Lx. Fl. Dak. Gr., p. 68, pl. xliv, f. 16, 1892.
Dakota group: Kansas.

Myrica obscura Lx. Cret. and Tert. Fl., p. 145, pl. xxxii, f. 8–10, 1883.
Green River group: Florissant, Colorado.

Myrica obtusa Lx. Cret. Fl., p. 63, pl. xxix, f. 10, 1874.
Dakota group: Kansas.

Myrica partita Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 412, 1873 [1874]; Tert. Fl., p. 134, pl. xvii, f. 14, 1878.
Green River group: Elko Station, Nevada.

Myrica (Comptonia) parvula Heer. Fl. Foss. Arct., vol. vii, p. 20, pl. lv, f. 1–3, 1883; Newby., Fl. Amboy Clays, p. 63, pl. xix, f. 6, 1895 [1896].
Amboy clay: Sayreville, New Jersey.

Myrica polymorpha Schimp., Études, ii, p. 220, 1868; Lx. Cret. and Tert. Fl., p. 146, pl. xxv, f. 1, 2, 1883.
Green River group: Florissant, Colorado.

Myrica (Comptonia) premissa (Lx.) Kn. Proc. U. S. Nat. Mus., vol. xvii, p. 222, 1894.
Comptonia premissa Lx. Proc. U. S. Nat. Mus., vol. v, p. 445, pl. vi, f. 13, 1882 [1883].
Eocene?: Unga Island, Alaska.

Myrica raritanensis Hollick In Newby. Fl. Amboy Clays, p. 65, pl. xlii, f. 34, 1895 [1896].
Amboy clay: No location.

Myrica rigida Lx. Cret. and Tert. Fl., p. 145, pl. xxv, f. 3, 4, 1883.
Green River group: Florissant, Colorado.

Myrica Saportana Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 385, 1875 [1876]. [Not afterwards mentioned.]
———: Middle Park, Colorado.

Myrica salicina Ung. Gen. et Sp. Pl. Foss., p. 396, 1850; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 6, 1871 [1872].
———: Green River, Wyoming.

Myrica Schimperi Lx. Fl. Dak. Gr., p. 66, pl. ii, f. 12, 1892.
Dakota group: Kansas.

Myrica Scottii Lx. Cret. and Tert. Fl., p. 147, pl. xxxii, f. 17, 18, 1883.
Green River group: Florissant, Colorado.

Myricæ ? semina Lx. Cret. Fl., p. 63, pl. xxvii, f. 4, 4*a*, 1874.
Dakota group: Decatur, Nebraska.

Myrica Sternbergii Lx. Cret. and Tert. Fl., p. 35, 1883.
Dakota group: Kansas.

Myrica Studeri? Heer. Fl. Tert. Helv., vol. ii, p. 36, pl. lxx, f. 21–24, 1856; Lx., Proc. U. S. Nat. Mus., vol. x, p. 38, 1887.
Eocene?: White River, Dakota.

Myrica Torreyi Lx. Ann. Rept. U. S. Geol. and Geog. Surv. Terr., p. 392, 1872 [1873]; Tert. Fl., p. 129, pl. xvi, f. 3–10, 1878.
Laramie group: Black Buttes, Wyoming.
Montana formation: Point of Rocks, Wyoming.

Myrica Torreyi minor Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 397, 1873 [1874].

———: Sand Creek, Colorado.

Myrica ? trifoliata Newby. Undistributed plates, xiv, f. 2.

Dakota group: Whetstone Creek, New Mexico.

Myrica undulata (Heer) Schimp. Pal. Vég., ii, p. 556, 1872; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 412, 1873 [1874]; Tert. Fl., p. 131, pl. xvii, f. 6–8, 1878.

Dryandroides undulata Heer. Fl. Tert. Helv., vol. iii, p. 188, 1859.

Green River group: Elko Station, Nevada.

Myrica Ungeri Heer. Fl. Tert. Helv., vol. ii, p. 35, pl. lxx, f. 7, 8, 1856; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 27, 1888.

Miocene: Spanish Peak, California.

Myrica vindobonensis (Ett.) Heer. Fl. Foss. Alask., p. 27, pl. iii, f. 4, 5, 1869.

Dryandra vindobonensis Ett. Tert. Fl. v. Wien., p. 18, pl. iii, f. 6, 1851.

Eocene?: Neuiltschik, Alaska.

Myrica Zachariensis Sap. Études, i, pt. 2: Ann. d. sci. nat. Bot., 4th ser., vol. xix, p. 201 [47], pl. v, f. 1, 1863; Lx., Cret. and Tert. Fl., p. 146, pl. xxv, f. 1, 2; pl. xlv*a*, f. 6–9, 1883.

Green River group: Florissant, Colorado; Alkali Station, Wyoming.

Myrica sp., Lx. Rept. on Clays in N. J., p. 29, 1878.

Amboy clay: South Amboy, New Jersey.

MYRICÆPHYLLUM Fontaine. Potomac Fl., p. 315, 1889.

Myricæphyllum dentatum Font. Potomac Fl., p. 316, pl. clvi, f. 6, 1889.

Potomac formation: Near Brooke, Virginia.

MYRSINE Linnæus. Syst., ed. i, 1735.

Myrsine borealis Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 81, pl. xxiv, f. 7*b*, 8; xxvii, f. 1*b*; xliv, f. 5*a*; xlvi, f. 19, 20, 1882; Newby., Fl. Amboy Clays, p. 122, pl. xxiv, f. 4–6, 1895 [1896].

Amboy clay: New Jersey.

Cretaceous: Marthas Vineyard.

Myrsine crassa Lx. Fl. Dak. Gr., p. 114, pl. lii, f. 2, 3, 1892.

Dakota group: Kansas.

Myrsine elongata Newby. MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 54, pl. clxxvii, f. 2, 1894; Newby., Fl. Amboy Clays, p. 123, pl. xxii, f. 1–3, 1895 [1896].

Cretaceous: Lloyds Neck, Long Island.

Amboy clay: South Amboy, New Jersey.

Myrsine latifolia Lx. Cret. and Tert. Fl., p. 173, pl. xxxviii, f. 16, 1883.

Green River group: Florissant, Colorado.

Myrsine oblongata Hollick in Newby. Fl. Amboy Clays, p. 122, xlii, f. 15, 1895 [1896].

Amboy clay: Locality unknown.

Myrsine sp., Hollick in Ries. School of Mines Quart., vol. xv, no. 4, p. 354, 1894.
Cretaceous: Little Neck, Northfield Bay, Long Island.

Myrsinites ? Gaudini Lx. Fl. Dak. Gr., p. 115, pl. lii, f. 4, 1892.
Dakota group: Kansas.

MYRTOPHYLLUM Heer. Neue Denkschr. Schw. Ges., vol. xxiii, mem. 2, p. 22, 1869.

Myrtophyllum Geinitzi Heer = Eucalyptus Geinitzi.

Myrtophyllum Warderi Lx. Fl. Dak. Gr., p. 136, pl. liii, f. 10, 1892.
Dakota group, Kansas.

MYRTUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Myrtus oregonensis Lx. Cret. and Tert. Fl., p. 254, pl. lviii, f. 10, 1883.
Miocene: Corral Hollow, California.

NAGEIOPSIS Fontaine. Potomac Fl., p. 194, 1889.

Nageiopsis acuminata Font. Potomac Fl., p. 201, pl. lxxxv, f. 11, 1889.
Potomac formation: Near Telegraph Station, Virginia.

Nageiopsis angustifolia Font. Potomac Fl., p. 202, pl. lxxxvi, f. 8, 9; lxxxvii, f. 2–6; lxxxviii, f. 1, 3, 4, 6–8; lxxxix, f. 2, 1889.
Potomac formation: Near Dutch Gap Canal, near Potomac Run, near Brooke, and Fredericksburg, etc., Virginia.

Nageiopsis crassicaulis Font. Potomac Fl., p. 198, pl. lxxix, f. 2–6; lxxxii, f. 1; lxxxiv, f. 3, 9, 11, 1889.
Potomac formation: Near Potomac Run, Fredericksburg, Kankeys, near Brooke, and Dutch Gap Canal, Virginia.

Nageiopsis decrescens Font. Potomac Fl., p. 199, pl. lxxvii, f. 3, 1889.
Potomac formation: Near Potomac Run, Virginia.

Nageiopsis heterophylla Font. Potomac Fl., p. 201, pl. lxxxiv, f. 4; lxxxvi, f. 6, 7; lxxxviii, f. 2, 5, 1889.
Potomac formation: Fredericksburg, and near Dutch Gap Canal, Virginia.

Nageiopsis inæquilateralis Font. Potomac Fl., p. 200, pl. lxxxv, f. 6, 1889.
Potomac formation: Kankeys.

Nageiopsis latifolia Font. Potomac Fl., p. 198, pl. lxxxii, f. 3, 1889.
Potomac formation: Near Dutch Gap Canal, and near Potomac Run, Virginia.

Nageiopsis longifolia Font. Potomac Fl., p. 195, pl. lxxv, f. 1; lxxvi, f. 2–6; lxxvii, f. 1, 2; lxxviii, f. 1–5; lxxix, f. 7; lxxxv, f. 1, 2, 8, 9, 1889.
Knoxville beds: Tehama County, California.
Potomac formation: Fredericksburg, Kankeys, near Telegraph Station, near Brooke, Deep Bottom, and Dutch Gap Canal, Virginia.

Nageiopsis microphylla Font. Potomac Fl., p. 201, pl. lxxxiv, f. 6; lxxxv, f. 14; lxxxvi, f. 1–3, 5, 1889.

Potomac formation: Fredericksburg, near Potomac Run, and near Dutch Gap Canal, Virginia.

Nageiopsis obtusifolia Font. Potomac Fl., p. 200, pl. lxxxv, f. 7, 1889.

Potomac formation: Near Potomac Run, Virginia.

Nageiopsis ovata Font. Potomac Fl., p. 199, pl. lxxvii, f. 4; lxxx, f. 5, 1889.

Potomac formation: Fredericksburg, Virginia.

Nageiopsis recurvata Font. Potomac Fl., p. 197, pl. lxxv, f. 2; lxxix, f. 4; lxxx, f. 3, 1889.

Potomac formation: Fredericksburg, and Dutch Gap Canal, Virginia.

Nageiopsis subfalcata Font. Potomac Fl., p. 203, pl. clxviii, f. 4, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

Nageiopsis zamioides Font. Potomac Fl., p. 196, pl. lxxix, f. 1, 3; lxxx, f. 1, 2, 4, lxxxi, f. 1–6, 1889.

Potomac formation: Fredericksburg, and Dutch Gap Canal, Virginia.

NAJADOPSIS Heer. Fl. Tert. Helv., vol. i, p. 104, 1855.

Najadopsis rugulosa Lx. Cret. and Tert. Fl., p. 142, pl. xxiii, f. 7, 1883.

Green River group: Florissant, Colorado.

NEGUNDOIDES Lesquereux. Am. Journ. Sci., vol. xlvi, p. 101, 1868.

Negundoides acutifolia Lx. Am. Journ. Sci., vol. xlvi, p. 101, 1868; Cret. Fl., p. 97, pl. xxi, f. 5, 1878.

Dakota group: Lancaster, Nebraska.

NEGUNDO Moench. Mett., p. 334, 1794.

Negundo triloba Newby. Later Extinct Floras, p. 57, 1868.

Fort Union group: Fort Union, North Dakota.

NELUMBIUM Jussieu. Gen., p. 68, 1789.

Nelumbium Lakesii Lx. = Nelumbium Lakesianum.

Nelumbium Lakesianum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 403, 1873 [1874].

Nelumbium Lakesii Lx. Tert. Fl., p. 252, pl. xlvi, f. 1, 2, 1878.

Denver group: Golden and Sedalia, Colorado.

Nelumbium pygmæum Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 87, f. (in text) 22, 1890.

Eocene?: Similkameen River, British Columbia.

Nelumbium saskatchuense Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 35, 1887 [1888].

Belly River series?: Canada [exact location not given].

Nelumbium tenuifolium Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 402, 1873 [1874]; Tert. Fl., p. 253, pl. xlvi, f. 3, 1878.

Laramie group: Sand Creek, Colorado.

Nelumbium sp., James = Cycadeoidea mirabilis.

NELUMBO Adanson. Fam. Pl., vol. ii, p. 76, 1763.

Nelumbo Dawsoni Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 309, 1894.

Brasenia antiqua* Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 15, f. (in text), 1885 [1886].

[* Brasenia antiqua Dn., 1886, preoccupied by B. antiqua Newby., 1883.]

Belly River series: Medecine Hat.

Nelumbo laramiensis Hollick. Bull. Torr. Bot. Club, vol. xxi, no. 7, p. 307, fig. in text, 1894.

Laramie group: Florence, Colorado.

Neuropteris angulata Newby. = Trapa microphylla?

Neuropteris castor Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 24, pl. iv, f. 14, 14*a*, 1882 [1883].

Upper Cretaceous: Vancouver Island.

Neuropteris civica Dn. Trans. Roy. Soc. Canada, 2d ser., vol. i, sec. iv, p. 141, pl. iv, f. 2, 1895-96.

Eocene: Burrards Inlet, Vancouver, British Columbia.

NILSONIA Brongniart. Ann. d. Sci. Nat., vol. iv, p. 218, 1825.

Nilsonia lata Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 24, pl. iv, f. 15 bis, 1882 [1883].

Upper Cretaceous: Baynes Sound, Vancouver Island.

NŒGGERATHIOPSIS Feistmantel. Foss. Fl. Gondwana Syst.: Mem. Geol. Surv. India, ser. xii, vol. iii, pt. 1, p. 23, 1879.

Nœggerathiopsis Robinsi Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 56, pl. vi, f. 7, 1893 [1894].

Upper Cretaceous: Nanaimo, Vancouver Island.

NORDENSKIÖLDIA Heer. Mioc. Fl. and Fauna Spitzb.: Kongl. Svenska Vetensk.-Acad. Handl., vol. viii, no. 7 (Fl. Foss. Arct., vol. ii, abt. iii), p. 65, 1870.

Nordenskiöldia borealis Heer. Fl. Foss. Arct., vol. ii, abt. iii, p. 65, pl. vii, f. 1-13, 1870; Lx., Fl. Dak. Gr., p. 219, pl. xliv, f. 6, 1892; Dn., Trans. Roy. Soc. Canada, vol. vii, sec. iv, p. 71, pl. x, f. 6, 1889 [1890].

Dakota group: Kansas.

Eocene?: Mackenzie River, British Columbia.

Nymphæa? sp. Lx. = Castalia sp.

NYSSA Gronovius ex Linnæus. Syst., ed. i, 1735.

Nyssa arctica Heer. Fl. Foss. Arct., vol. ii, abt. iv, p. 477, pl. xliii, f. 12*c*; pl. l, f. 5-7, 1869; Lx., Proc. U. S. Nat. Mus., vol. v, p. 447, 1882 [1883].

Eocene?: Unga Island, Alaska.

Nyssa Buddiana Ward. Bull. U. S. Geol. Surv., no. 37, p. 53, pl. xxv, f. 4, 1887.

Laramie group: Hodges Pass, Wyoming.

Nyssa caroliniana Poir. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.

Miocene?: Bridgeton, New Jersey.

Nyssa complanata Lx. Am. Journ. Sci., vol. xxxii, p. 361, 1861; Geol. Vt., vol. ii, p. 717, f. 153, 1861.
———: Brandon, Vermont.

Nyssa europæa Ung. Syn. Pl. Foss., p. 228, 1845; Lx., Bull. Mus. Comp. Zoöl., vol. xvi, p. 53, 1888.
Denver group: Golden, Colorado.

Nyssa lanceolata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 407, 1872 [1873]; Tert. Fl., p. 245, pl. xxxv, f. 6 [non f. 5], 1876.
Denver group; Golden, Colorado?
Laramie group: White Oaks, New Mexico.

Nyssa lanceolata Lx. [Tert. Fl., pl. xxxv, f. 5 (non f. 6)]=Juglans rugosa.

Nyssa lævigata Lx. Am. Journ. Sci., vol. xxxii, p. 361, 1861; Geol. Vt., vol. ii, p. 717, f. 151, 1861.
———: Brandon, Vermont.

Nyssa microcarpa Lx. Am. Journ. Sci., vol. xxxii, p. 361, 1861; Geol. Vt., vol. ii, p. 717, f. 154, 1861.
———: Brandon, Vermont.

Nyssa? racemosa nom. nov.
Sabalites? fructifer Lx. Ex. p. Tert. Fl. p. 114, pl. xi, f. 3*a* [non f. 3], 1878.
Denver group: Golden, Colorado.

Nyssa Snowiana Lx. Fl. Dak. Gr., p. 126, pl. lii, f. 11, 1892.
Dakota group: Kansas.

Nyssa uniflora Walt. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.
Miocene?: Bridgeton, New Jersey.

Nyssa vetusta Newby. Later Extinct Floras, p. 11, 1868.
Dakota group: Blackbird Hill, Nebraska.

OLEA Linnæus. Syst., ed. i, 1735.

Olea præmissa Lx. Cret. and Tert. Fl., p. 168, pl. xxxiii, f. 1, 1883.
Green River group: Florissant, Colorado.

OLEANDRA Cavanilles. Prael. n. 623, 1801.

Oleandra arctica Heer. Fl. Foss. Arct., vol. iii, p. 38, pl. xii, f. 3–11, 1874; Newby., Am. Journ. Sci., vol. xli, p. 201, pl. xiv, f. 9, 1891.
Kootanie: Great Falls, Montana.

ONOCLEA Linnæus. Amoen. ac., 1751.

Onoclea fecunda (Lx.) n. comb.
Caulinites fecunda Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 384, 1872 [1873]; Tert. Fl., p. 101, pl. xiv, f. 1–3, 1878.
Laramie group: Erie, Colorado.

Onoclea sensibilis Newby. Later Extinct Floras, p. 39, 1868; Ills., Cret. and Tert. Fl., pl. viii, f. 1; ix, f. 1–5, 1878.
Fort Union group: Fort Union, North Dakota; Porcupine Creek; North Saskatchewan.

ONYCHIOPSIS Yokoyama. Journ. Col. Sci. Japan, vol. iii, p. 26, 1890.

Onychiopsis Mantelli (Brongn.) Seward. Wealden Fl., p. 41, 1894.

Sphenopteris Mantelli Brongn. Prod. Hist. Vég. Foss., p. 50, 1828; Hist. Vég. Foss., p. 170, 1828; Font., Potomac Fl., p. 91, pl. 1, f. 1, 2, 1889.

Potomac formation: Baltimore, Maryland.

OPEGRAPHA Persoon in Usteri n. Ann., I., p. 23, 1794.

Opegrapha antiqua Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p, 390, 1872 [1873]; Tert. Fl., p. 36, pl. i, f. 1–1*c*, 1878.

Laramie group: Black Buttes, Wyoming.

OPHIOGLOSSUM (Tournefort) Linnæus. Gen. Pl., p. 332, 1737.

Ophioglossum Alleni Lx.=Tmesipteris Alleni.

Ophioglossum granulatum Heer. Fl. Foss. Arct., vol. vii, p. 8, pl. lvii, f. 8, 9, 1883; Fl. Amboy Clays, p. 43, pl. ix, f. 11–13, 1895 [1896].

Amboy clay: No locality given.

OREODAPHNE Nees and Martius. Ex Nees in Linnæa, vol. viii, p. 39, 1833.

Oreodaphne cretacea Lx. Cret. Fl., p. 84, pl. xxx, f. 5, 1874.

Dakota group: Kansas.

Oreodaphne Heerii Gaud. Neue Denkschr. Schw. Gesel., vol. xvi, p. 35, 1858; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 30, 1888.

Eocene: Lassen County, California.

Oreodaphne lith(s)æformis Lx. Proc. U. S. Nat. Mus., vol. xi, p. 30, pl. xiv, f. 4, 1888.

Eocene?: Lassen County, California.

OREODOXITES Göppert. Foss. Fl. d. Perm. Form., p. 146, 1864.

Oreodoxites plicalus Lx. Cret. and Tert. Fl., p. 122, pl. xviii, f. 1–4, 1883.

Denver group: Golden, Colorado.

ORYZOPSIS Michaux. Fl. Bor. Am., vol. i, p. 51, 1803.

Oryzopsis asperifolia Mx. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 331, 1890.

Pleistocene: Greens Creek, Ottawa River, Canada.

OSMUNDA Linnæus. Gen. Pl., p. 322, 1737.

Osmunda affinis Lx. Tert. Fl., p. 60, pl. iv, f. 1, 1878.

Pteris affinis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 392, 1873 [1874].

Peteris anceps Lx. Ann. Rept., op. cit., p. 376, 1872 [1873].

Denver group: Golden, Colorado.

Osmunda dicksonioides Font. Potomac Fl., p. 146, pl. xli, f. 5; lviii, f. 9; lix, f. 1, 4, 8, 9, 11; lx, f. 2, 4, 5, 9; lxi, f. 1, 2, 1889.

Potomac formation: Near Potomac Run, Virginia.

Kootanie: Great Falls, Montana.

Knoxville beds: Tehama County, California.

Osmunda dicksonioides latipennis Font. Potomac Fl., p. 147, pl. lx, f. 1, 3; lxi, f. 3, 1889.

Potomac formation: Near Potomac Run, Virginia.

Osmunda Doroschkiana Göpp. Abhandl. d. Schles. Gesel. f. Vaterl.-Cult., pt. ii, p. 203, 1861.

Osmunda Torelli Heer. Fl. Foss. Arct., vol. v, abt. iii, p. 19, pl. i, f. 4, 1878. Lx., Proc. U. S. Nat. Mus., vol. v, p. 444, 1882 [1883].

Hemitelites Torelli Heer. Op. cit., vol. ii, abt. iv, p. 462, 1869.

Pecopteris Torrellii Heer. Op. cit., vol. i, p. 88, pl. i, f. 15, 1868.

Eocene? : Unga Island, Alaska.

Osmunda major Lx.= Asplenium subsimplex.

Osmunda Obergiana Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 98, pl. xxvi, f. 9–9*b*; xxxii, f. 7*a*, 1874; Ward, 15th Ann. Rept. U. S. Geol. Surv., p. 390, 1895.

Potomac formation: ———?

Osmunda sphenopteroides Font. Potomac Fl., p. 145, pl. xxv, f. 13, 1889.

Potomac formation: Dutch Gap Canal, Virginia.

Osmunda Torelli Heer =Osmunda Doroschkiana.

OSTRYA Scopoli. Fl. Carn., p. 414, 1760.

Ostrya betuloides Lx. Cret. and Tert. Fl., p. 151, 1883.

Green River group: Florissant, Colorado.

Ostrya Walkeri? Heer. Vierteljahrsschrift d. Naturf. Gesells. Zürich, vol. xi, p. 276, 1866; Lesquereux, Proc. U. S. Nat. Mus., vol. x, p. 38, 1887.

Pleistocene? : Wytheville, Virginia.

Ostrya virginica (Mill.) B. S. P. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.

Miocene? : Bridgeton, New Jersey.

OXYCOCCUS Adanson. Pl. Fam., vol. ii, pl. 164, 1763.

Oxycoccus palustris Pers. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 72, 1896.

Pleistocene: Scarboro Heights, Ontario.

OTTELIA Pers. Syn., vol. i, p. 400, 1805.

Ottelia americana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 300, 1874 [1876]; Tert. Fl., p. 98, pl. lxi, f. 8, 1878.

Montana formation: Point of Rocks, Wyoming.

PAGIOPHYLLUM Heer. Contr. Fl. Foss. du Portugal, p. 11, 1881.

Pagiophyllum dubium Font. Proc. U. S. Nat. Mus., vol. xvi, p. 271, pl. xxxix, f. 2–11, 1893.

Trinity division: Glenrose, Texas.

Pagiophyllum sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 90, f. (in text) 14, 1892.

Kootanie: Anthracite? British Columbia.

PALÆANTHUS Newberry. Bull. Torr. Bot. Club, vol. xiii, p. 37, 1886.

Palæanthus (Williamsonia) problematicus Newby. Fl. Amboy Clays, p. 125, pl. xxxv, f. 1–9, 1895 [1896].

Williamsonia problematica (Newby.) Ward. 15th Ann. Rept. U. S. Geol. Surv., p. 382, 1895.

Amboy clay: New Jersey.

Cretaceous: Marthas Vineyard.

PALÆOCASSIA Ettingshausen. Sitzb. Wien. Akad., vol. lv, abt. i, p. 261, 1867.

Palæocassia laurinea Lx. Fl. Dak. Gr., p. 147, pl. lxiv, f. 12, 1892.

Dakota group: Kansas.

PALEOHILLIA Knowlton. Bull. Torr. Bot. Club., vol. xxii, p. 387, 1895.

Paleohillia arkansana Kn. Bull. Torr. Club, vol. xxii, p. 387, f. (in text) 1–3, 1895.

Trinity division: Six miles northwest of Center Point, Howard County, Arkansas.

PALIURUS Tournefort. Ex. Miller Gard. Dict., ed. vi. 1752.

Paliurus affinis ? Heer. Fl. Foss. Arct., vol. vii, p. 42, 1883; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 35, pl. ii, f. 12, 14, 18, 19; pl. iii, f. 7, 1892.

Cretaceous: Staten Island.

Paliurus anceps Lx. Fl. Dak. Gr., p. 166, pl. xxxv, f. 4, 1892.

Dakota group: Kansas.

Paliurus Colombi Heer. Fl. Foss. Arct., vol. i, p. 122, pl. xvii, f. 2*d*; pl. xix, f. 2–4, 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 288, 1871 [1872]; Tert. Fl., p. 273, pl. l, f. 13–17, 1878.

Fort Union group: Yellowstone River, Montana.

Denver group?: Creston, Wyoming.

Laramie group?: Carbon, Wyoming.

Miocene: John Day Valley, Oregon.

Canadian upper Laramie: Great Valley, British Columbia.

Paliurus coloradensis Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 55, 1888.

Denver group: Golden, Colorado.

Paliurus cretaceus Lx. Fl. Dak. Gr., p. 165, pl. xxxv, f. 3, 1892.

Dakota group: Kansas.

Paliurus florisanti Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 416, 1873 [1874]; Tert. Fl., p. 274, pl. l, f. 18, 1878.

Green River group: Florissant, Colorado.

Paliurus intigrifolius Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 57, pl. clxxvii, f. 5, 8, 12, 1894.

Clay marl [Upper Cretaceous]: Cliffwood, New Jersey?.

Cretaceous: Lloyds Neck, Glen Cove, and Oak Neck, Long Island.

Paliurus membranaceus Lx. Am. Journ. Sci., vol. xlvi, p. 101, 1868; Cret. Fl., p. 108, pl. xx, f. 6, 1874; Fl. Dak. Gr., p. 167, pl. xxxv, f. 5, 1892.
Dakota group: Decatur, Nebraska; Kansas.
Cretaceous: Marthas Vineyard, Massachusetts.

Paliurus montanus Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 14, 1885 [1886].
Mill Creek series: North Fork Old Man River.

Paliurus neillii Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 62, pl. xi, f. 44, 45, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island.

Paliurus obovatus Lx. Fl. Dak. Gr., p. 165, pl. xxxv, f. 6, 1892.
Dakota group: Kansas.

Paliurus ovalis Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 14, pl. iv, f. 4, 8, 1885 [1886]; Newby., Fl. Amboy Clays, p. 107, pl. xxiii, f. 8, 9, 1895 [1896]; Lx., Fl. Dak. Gr., p. 166, p. xxxv, f. 7, 1892.
Mill Creek series: Mill Creek.
Amboy clay: New Jersey.
Dakota Group: Kansas.

Paliurus orbiculatus Sap. Études iii, Ann. Sci. Nat., 5th ser., vol. ix, p. 182, pl. vii, f. 6, 1867; Lx., Cret. and Tert. Fl., p. 188, pl. xxxviii, f. 12, 1883.
Green River group: Florissant, Colorado.

Paliurus Pealei Ward. Bull. U. S. Geol. Surv., no. 37, p. 76, pl. xxxiii, f. 12–14, 1887.
Fort Union group?: Little Missouri River, Montana.

Paliurus pulcherrimus Ward. Bull. U. S. Geol. Surv., no. 37, p. 75, pl. xxxiii, f. 11, 1887.
Laramie group: Carbon, Wyoming.

Paliurus zizyphoides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 397, 1872 [1873]; Tert. Fl., p. 274, pl. li, f. 1–6, 1878.
Denver group: Golden, Colorado.
Laramie group: Erie, and Sand Creek, Colorado; Black Buttes, Wyoming.

Palmacites goldianus Lx.=Geonomites goldianus.

PALMOCARPON Lesquereux. Tert., Fl., p. 119, 1878.

Palmocarpon commune Lx.=Palmocarpon palmarum.

Palmocarpon compositum Lx. Tert. Fl., p. 119, pl. xi, f. 4, 1878.
Carpolithes compositus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 16, 1871 [1872].
Laramie group: Placer Mountain, New Mexico.

Palmocarpon corrugatum Lx. Tert. Fl., p. 121, pl. xi, f. 10, 11, 1878.
Denver group: Golden, Colorado.

Palmocarpon? globosum Lx. Cret. and Tert. Fl., p. 144, pl. xxiv, f. 3, 1883.
Green River group: Florissant, Colorado.

Palmocarpon lineatum Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 44, 1888.
Denver group: Golden, Colorado.

Palmocarpon mexicanum Lx. Tert. Fl., p. 119, pl. xi, f. 5, 1878.
Carpolithes mexicanus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 17, 1871 [1872].
Laramie group: Placer Mountain, New Mexico.

Palmocarpon palmarum (Lx.) n. comb.
Palmocarpon commune Lx. Tert. Fl. p. 119, pl. xiii, f. 4-7, 1878.
Carpolithes palmarum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 13, 1871 [1872].
Denver group: Golden, Colorado (very common).
Laramie group: Raton Mountains, New Mexico; Evanston and Black Buttes, Wyoming; Morrison and Golden, Colorado.

Palmocarpon subcylindricum Lx. Tert. Fl., p. 121, pl. xi, f. 12, 1878.
Denver group: Golden, Colorado.

Palmocarpon truncatum Lx. Tert. Fl., p. 120, pl. xi, f. 6-9, 1878.
———: Golden, Colorado.

PALMOXYLON Schenk. Engler's bot. Jahrb., vol. iii, p. 486, 1882.

Palmoxylon cellulosum Kn. Proc. U. S. Nat. Mus., vol. xi, p. 90, pl. xxx, f. 2, 1888.
———: Rapides Parish, Louisiana.

Palmoxylon Quenstedti Felix. Foss. Hölz. Westindiens, p. 25, pl. iv, f. 4, 1883; Kn., Proc. U. S. Nat. Mus., vol. xi, p. 90, pl. iv, f. 4, 1888.
———: Rapides Parish, Louisiana.

PARROTIA C. A. Meyer. Verz. Pfl. Canc., p. 46, 1831.

Parrotia Canfieldi Lx. Fl. Dak. Gr., p. 141, pl. xxx, f. 6, 1892.
Dakota group: Kansas.

Parrotia grandidentata Lx. Fl. Dak. Gr., p. 140, pl. xxxix, f. 2-4, 1892.
Dakota group: Kansas.

Parrotia? Winchelli Lx. Fl. Dak. Gr., p. 140, pl. xxix, f. 5, 6, 1892.
Dakota group: Minnesota; Kansas.

PASSIFLORA Linnæus. Syst., ed. i, 1735.

Passiflora antiqua Newby. Fl. Amboy Clays, p. 109, pl. xxiii, f. 7, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

PECOPTERIS Brongniart. Hist. Vég. Foss., p. 267, 1828.

Pecopteris angustipennis Font. Potomac Fl., p. 87, pl. xxi, f. 10, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Pecopteris brevipennis Font. Potomac Fl., p. 86, pl. xxi, f. 1-3, 1889.
Potomac formation: Near Potomac Run, and near Dutch Gap Canal, Virginia.

Pecopteris Browniana Dunk. = Cladophlebis Browniana.

Pecopteris constricta Font. Potomac Fl., p. 86, pl. xx, f. 1, 2, 4, 1889.
Potomac formation: Fredericksburg, Virginia.

Pecopteris Dunkeri Schimp. = Cladophlebis Dunkeri.

Pecopteris microdonta Font. Potomac Fl., p. 85, pl. xix, f. 8; xx, f. 5, 11, 1889.
Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia.

Pecopteris montanensis Font. Proc. U. S. Nat. Mus., vol. xv, p. 492, pl. lxxxiii, f. 1, 1*a*, 1892.
Kootanie: Great Falls, Montana.

Pecopteris nebraskana ? Heer = Cyathites nebraskana.

Pecopteris ovatodentata Font. Potomac Fl., p. 85, pl. xv, f. 8; xxii, f. 12; xxii, f. 1, 1889.
———: Fredericksburg and Dutch Gap Canal, Virginia.

Pecopteris pachyphylla Font. Potomac Fl., p. 88, pl. xxvi, f. 4, 5, 1889.
Potomac formation: Fredericksburg, Virginia.

Pecopteris (Phegopteris) sepulta Newby. Proc. U. S. Nat. Mus., vol. v, p. 503, 1882 [1883].
Eocene: Green River, Wyoming.

Pecopteris (Pteris?) socialis Heer. Fl. Foss. Arct., vol. vi, pt. ii, p. 34, pl. vii, f. 4, 1882; Font., Potomac Fl., p. 87, pl. xxi, f. 7, 1889.
Potomac formation: Near Brooke, Virginia.

Pecopteris strictinervis Font. Potomac Fl., p. 84, pl. xiii, f. 6-8; xix, f. 9; xx, f. 3; xxii, f. 13; clxx, f. 5, 6, 1889.
Potomac formation: Fredericksburg, Virginia; Baltimore, Maryland.
Knoxville beds: Tehama County, California.

Pecopteris Torelli Heer = Osmunda Doroschkiana.

Pecopteris virginiensis Font. Potomac Fl., p. 82, pl. viii, f. 1-7; ix, f. 1-6; xxiv, f. 2; clxix, f. 3, 1889.
Potomac formation: Near Dutch Gap Canal, Fredericksburg, Potomac Run, near Brocke, and near Telegraph Station, Virginia; Baltimore, Maryland.

Pecopteris sp., Dn. Geol. Surv. Canada, Rept. of Progress for 1872-73, Appen. i, p. 70, 1873.
Cretaceous: Hornby Island, British Columbia.

Pecopteris sp., Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 25, 1882 [1883].
Upper Cretaceous: Baynes Sound, Vancouver Island.

PERSEA Gærtner. Fr. and Sem., vol. iii, p. 222, 1805.

Persea Borbonia (L.) Spreng. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Laurus carolinensis Michx. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 363, 1859; Geol. Tenn., p. 426, pl. K, f. 10, 1869.
Pleistocene?: Somerville, Fayette County, Tennessee.
Miocene?: Bridgeton, New Jersey.

Persea brossiana Lx. Ann. Rept., op. cit., p. 407, 1873 [1874].
Laurus brossiana Lx. Tert. Fl., p. 216, pl. xxxvi, f. 9, 1878.
Denver beds: Mount Bross, Middle Park, Colorado.

Persea Dilleri Lx. Proc. U. S. Nat. Mus., vol. xi, p. 27, pl. xiii, f. 2–4, 1888.
Miocene: Shasta County, California.

Persea Hayana Lx. Fl. Dak. Gr., p. 103, pl. xvi, f. 6, 1892.
Dakota group: Kansas.

Persea lancifolia Lx. Trans. Am. Phil. Soc., vol. xiii, p. 419, pl. xix, f. 3, 4, 1869.
Eolignitic: Mississippi.

Persea Leconteana Lx. Cret. Fl, p. 75, pl. xxviii, f. 1, 1874.
Sassafras Leconteanum Lx. Trans. Am. Phil. Soc., vol. xiii, p. 431, pl. xxiii, f. 1, 1869.
Quercus Benzoin? Lx. Am. Journ. Sci., vol. xxvii, p. 360, 1859.
Dakota group: Fort Harker, Kansas.
———?: Nanaimo, Vancouver Island.

Persea nebrascensis Lx. = Laurus nebrascensis.

Persea pseudo-carolinensis Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 19, pl. vii, f. 1, 2, 1878.
Miocene: Table Mountain and Corral Hollow, California.

Persea punctulata Lx. Proc. U. S. Nat. Mus., vol. xi, p. 26, pl. xiv, f. 1, 1888.
Miocene?: Corral Hollow, California.

Persea Schimperi Lx. Fl. Dak. Gr., p. 103, pl. xvi, f. 5, 1892.
Dakota group: Kansas.

Persea speciosa? Heer. Fl. Tert. Helv., vol. ii, p. 81, pl. xc, f. 11, 12; c, f. 18, 1856; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 36, 1888.
———?: Selma, Texas.

Persea Sternbergii Lx. Cret. Fl., p. 76, pl. vii, f. 1, 1874.
Ficus Sternbergii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 423, 1872 [1873].
Dakota group: Fort Harker, Kansas.

PERSEOXYLON Felix. Jahrb. d. Kgl. Ungar. Geol. Anstalt, vol. viii, p. 153 [11], 1887.

Perseoxylon aromaticum Felix. Jahrb. d. Kgl. Ungar. Geol. Anstalt, p. 157, 1887; Zeitschr. d. Deutschen geol. Gesell. Jahr. 1896, p. 254, 1896,
Laurinoxylon aromaticum Felix. Jahrb. d. Kgl. Ungar. Geol. Anstalt., vol. vii, p. 27, pl. i, f. 7; ii, f. 7, 9, 1884.
Eocene: Yanceys, Yellowstone National Park; Hungary.

PERSOONIA Swartz. In Trans. Linn. Soc., vol. iv, p. 215, 1798.

Persoonia Lesquereuxii Kn. in Lx. Fl. Dak. Gr., p. 89, pl. xx, f. 10–12, 1892; Newby., Fl. Amboy Clays, p. 71, pl. xlii, f. 16, 1895 [1896].
Dakota group: Kansas.
Amboy clay: No location.

Persoonia oviformis Lx. Am. Journ. Sci., vol. xxvii, p 361, 1859.
———: Bellingham Bay.

Persoonia spatulata Hollick. in Newby. Fl. Amboy Clays, p. 71, pl. xlii, f. 14, 1895 [1896].
Amboy clay: No location.

PHASEOLITES Unger. Synop. Pl. Foss., p. 244, 1845.

Phaseolites formus Lx. Fl. Dak. Gr., p. 147, pl. lv, f. 5, 6, 12, 1892.
Dakota group: Kansas.

Phaseolites juglandinus? Heer. Lesquereux, Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 388, 1875 [1876].
———: Green River near mouth of White River.

PHEGOPTERIS Presl. Pterid., p. 179, 1836.

Phegopteris Grothiana Heer. Fl. Foss. Arct., vol. vii, p. 3, pl. xlviii, f. 12, 13, 1883; Fl. Amboy Clays, p. 42, pl. iii, f. 4, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

PHRAGMITES Trinius. Fund. Agrost., p. 134, 1820.

Phragmites alaskana Heer. Fl. Foss. Alask., p. 24, pl. i, f. 12, 1869; Lx., Ann. Rept., op. cit., p. 296, 1871 [1872]; Tert. Fl., p. 90, pl. viii, f. 10-12, 1878.
Eocene?: Port Graham, Alaska.
Fort Union group: Montana.
Livingston beds?: Bozeman coal field, Montana.
Green River group: Green River, Colorado.

Phragmites cordaiformis Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv., p. 26, pl. v, f. 22, 1882 [1883].
Upper Cretaceous: North Saanich and Nanaimo; Baynes Sound, Vancouver.

Phragmites cretaceus Lx. Cret. Fl., p. 55, pl. i, f. 13, 14; pl. xxix, f. 7, 1874; Fl. Dak. Gr., p. 37, pl. ii, f. 8, 1892.
Arundo cretaceus Lx. Am. Journ. Sci., vol. xlvi, p. 92, 1868.
Equisetum nodosum Lx. Cret. and Tert. Fl., p. 25, 1883.
Dakota group: Kansas.

Phragmites œningensis Al. Br. In Stizenberger, Verstein., p. 75, 1851; Lx., Ann. Rept. U. S. Geol. and Geor. Surv. Terr., p. 284, 1871, [1872]; Tert. Fl., p. 88, pl. viii, f. 1, 2, 1878.
Miocene: John Day Valley, Oregon.
True Laramie to Upper Miocene or Pliocene.

Phragmites sp., Dn. Rept. on Geol. and Res., near 49th Parallel, Appen. A, p. 329, 1875.
———: Porcupine Creek.

Phragmites sp., Newby. Later Extinct Floras, p. 38, 1868.
Fort Union group: Fort Union, North Dakota.

PHYLLITES Sternberg. Vers., vol. i, fasc. iii, p. 39, 1823.

Phyllites aceroides Heer. Fl. Foss. Arct., vol. i, p. 139, pl. xxiii, f. 5, 1868.
Miocene?: Mackenzie River, British Columbia.

Phyllites amorphus Lx. Am. Journ. Sci., vol. xlvi, p. 102, 1868; Cret. Fl., p. 113, pl. xxii, f. 3, 4, 1874.
Dakota group: Decatur, Nebraska.

Phylites arctica Kn. Proc. U. S. Nat. Mus., vol. xvii, p. 230, pl. ix, f. 10, 11, 1894.
Eocene?: Herendeen Bay, Alaska.

Phyllites aristolochiæformis Lx. Fl. Dak. Gr., p. 217, pl. lix, f. 8, 1892.
Dakota group: Kansas.

Phyllites amissus Lx. Fl. Dak. Gr., p. 217, pl. lxii, f. 1, 1892.
Dakota group: Kansas.

Phyllites betulæfolius Lx. Trans. Am. Phil. Soc., vol. xiii, p. 430, pl. xxiii, f. 2–4, 1869; Cret. Fl., p. 112, pl. xxviii, f. 4–7, 1874.
Dakota group: Kansas and Nebraska.

Phyllites carneosus Newby. Later Extinct Floras, p. 75, 1868.
Fort Union group: Fort Union, North Dakota.

Phyllites celatus Lx. Fl. Dak. Gr., p. 215, pl. lxi, f. 1, 1892.
Dakota group: Kansas.

Phyllites cotinus Lx. = Liriodendron primævum.

Phyllites cupanioides Newby. = Pterospermites cupanioides.

Phyllites cuspidatus Rossm. Lx. = Quercus cf. cuspidata.

Phyllites cyclophylla[us] (Lx.) Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 256, pl. ccv, f. 11, 1894.
Salvinia cyclophylla Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 408, 1873 [1874]; Tert. Fl., p. 64, pl. v, f. 10, 10*a*, 1878.
Green River group: Middle Park, Colorado.

Phyllites durescens Lx. Fl. Dak. Gr., p. 218, pl. lxi, f. 5; pl. lxii, f. 3, 1892.
Dakota group: Kansas.

Phyllites ellipticus Newby. Fl. Amboy Clays, p. 130, pl. xxiv, f. 9, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Phyllites erosus Lx. Fl. Dak. Gr., p. 216, p. lxi, f. 4, 1892.
Dakota group: Kansas.

Phyllites flexuosus Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii; p. 735, pl. cii, f. 8, 1898.
Payette formation: Near Marsh post-office, Boise County, Idaho.

Phyllites fraxineus Lx. Proc. U. S. Nat. Mus., vol. x, p. 46, 1887. Nomen nudum.
Pleistocene: Bridgeton, New Jersey.

Phyllites ilicifolius Lx. Fl. Dak. Gr., p. 213, pl. x, f. 9, 1892.
Dakota group: Kansas.

Phyllites improbatus Lx. Tert. Fl., p. 107, pl. xiv, f. 18, 1878.
Rhizocaulon gracile Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1873 [1874]. [Non R. gracile Sap., 1861.]
Laramie group: Black Buttes, Wyoming.

Phyllites innectens Lx. Fl. Dak. Gr., p. 219, pl. lxv, f. 6, 1892.
Dakota group: Kansas.

Phyllites juglandiformis Sternb. [1825]=Hicoria juglandiformis.

Phyllites Lacoei Lx. Fl. Dak. Gr., p. 213, pl. xlv, f. 6, 1892.
Dakota group: Kansas.

Phyllites laurencianus Lx. Fl. Dak. Gr., p. 215, pl. xliv, f. 5, 1892.
Dakota group: Kansas.

Phyllites mahoniæformis Heer. Neue Denkschr., vol. xxi, p. 10, pl. ii, f. 9, 1865.
———: Burrard Inlet, British Columbia.

Phyllites mimusopsoides Lx. Proc. U. S. Nat. Mus., vol. x, p. 46, 1887. Nomen nudum.
Pleistocene: Bridgeton, New Jersey.

Phyllites obcordatus Heer=Liriodendron primævum.

Phyllites obscura[us] Hollick in Newby. Fl. Amboy Clays, p. 131, pl. xlii, f. 33, 1895 [1896].
Amboy clay: New Jersey.

Phyllites obtusi-lobatus Heer. Proc. Acad. Nat Sci., Phila., vol. x, p. 266, 1858.
Dakota group: Kansas?

Phyllites orbicularis Newby. Fl. Amboy Clays, p. 130, pl. xxiv, f. 7, 8, 1895 [1896].
Amboy clay: Sayreville, New Jersey.

Phyllites payettensis nom nov.
Phyllites obscurus * Kn., Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 735, pl. xcix, f. 10, 11, 1898.
[* Phyllites obscurus Kn., antedated by P. obscura. Hollick, 1895.]
Payette formation: Near Marsh post-office, Boise County, Idaho.

Phyllites pachyphyllus Font. Potomac Fl., p. 325, pl., cxlix, f. 2, 1889.
Potomac formation: Fredericksburg, Virginia.

Phyllites perplexus Lx. Fl. Dak. Gr., p. 215, pl. xxxviii, f. 15, 1892.
Dakota group: Kansas.

Phyllites poinsettioides Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 37, pl. i, f. 10, 1892.
Cretaceous: Staten Island.

Phyllites rhoifolius Lx. Am. Journ. Sci., vol. xlvi, p. 101, 1868; Cret. Fl., p. 111, pl xxii, f. 5, 6, 1874.
Dakota group: Lancaster County, Nebraska.

Phyllites rhomboideus Lx. Cret. Fl., p. 112, pl. vi, f. 7, 1874.
Ficus? rhomboideus Lx. Am. Journ. Sci., vol. xlvi, p. 96, 1868.
Dakota group: Decatur, Nebraska.

Phyllites sapindiformis Lx. Tert. Fl., p. 301, pl. xxix, f. 6, 7, 1878.
Green River group: Green River? Wyoming.

Phyllites Snowii Lx. Fl. Dak. Gr., p. 214, pl. xxxviii, f. 2, 1892.
Dakota group: Kansas.

Phyllites stipulæformis Lx. Fl. Dak. Gr., p. 216, pl. lxi, f. 2, 1892.
Dakota group: Kansas.

Phyllites sulcatus Lx. Am. Journ. Sci., vol. xlv, p. 206, 1868. [Not afterwards employed by Lesquereux.]
Laramie group?: Marshalls, Colorado.

Phyllites truncatus Lx. Trans. Am. Phil. Soc., vol. xiii, p. 423, pl. xvii, f. 9, 1869.
Eolignitic: Mississippi.

Phyllites umbonatus Lx. Am. Journ. Sci., vol. xlvi, p. 102, 1868.
Dakota group: Beatrice, Nebraska.

Phyllites undulatus Newby. Fl. Amboy Clays, p. 131, pl. xxiv, f. 10, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Phyllites vanonæ Heer. Phyll. Crét. d. Nebr., p. 22, pl. i, f. 8, 1866; Lx., Cret. Fl., p. 113, pl. xx, f. 7; pl. xxviii, f. 8, 1874; Fl. Dak. Gr., p. 214, pl. xx, f. 9; pl. xlii, f. 5, 1892.
Dakota group: Decatur, Nebraska; Kansas.

Phyllites venosus Newby. Later Extinct Floras, p. 75, 1868.
Fort Union group: Fort Union, North Dakota.
Canadian upper Laramie: Porcupine Creek, Canada.

Phyllites wascoensis Lx. Proc. U. S. Nat. Mus., vol. xi, p. 22, pl. xv, f. 3, 1888.
Eocene?: Cherry Creek, Oregon.

Phyllites zamiæformis Lx. Fl. Dak. Gr., p. 28, pl. ii, f. 7, 1891.
Dakota group: Kansas.

Phyllites sp., Dn. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 32, pl. ii, f. 20, 1886 [1887].
Canadian upper Laramie: Great Valley.

Phyllites sp.? Lx. Fl. Dak. Gr., p. 218, pl. lix, f. 7, 1892.
Dakota group: Kansas.

Phyllites sp., Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 64. 1893 [1894].
Upper Cretaceous: Vancouver Island.

PHYLLOCLADOPSIS Fontaine. Potomac Fl., p. 204, 1889.

Phyllocladopsis heterophylla Font. Potomac Fl., p. 204, pl. lxxxiv, f. 5; clxvii, f. 4, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Phyllocladus subintegrifolius Lx.=Thinfeldia subintegrifolia.

PHYSAGENIA Heer. Fl. Tert. Helv., vol. i, p. 109, 1855.

Physagenia Parlatorii Heer.=Equisetum Parlatorii.

Physagenia sp., Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 43, 1888.
Denver group: Golden, Colorado.

PICEA Link. Abhandl. Akad. Wiss. Berlin 1827, p. 179, 1827-1830.

Picea alba Link=Picea canadensis.

Picea canadensis (Mill.) B. S. P.

Picea alba Link. Handb., vol. ii, p. 478, 1831; Penhallow, Bull. Geol. Soc. Am., vol. i, p. 333, 1890.

Pleistocene: Bloomington, Illinois.

Picea Mariana (Mill.) B. S. P.

Picea nigra Link. Handb., vol. ii, p. 478, 1831; Penhallow in Dawson, Can. Rec. Sci., vol. v, p. 353, 354, 1895.

Pleistocene: Don Valley, Toronto; Hamilton, Ontario; Leda clay, Montreal; Missinaibi River.

Picea nigra Link=Picea Mariana.

Picea sitchensis Carr. Knowlton, Journ. Geol., vol. iii, p. 529, f. (in text) 1, 1895; Penhallow in Coleman, Journ. Geol., vol. iii, p. 635, 1895.

Interglacial: Muir Glacier, Alaska.

Pleistocene: Don River, Canada.

PIMELEA Banks and Solander. Ex Gært. Fruct., vol. i, p. 186, 1788.

Pimelea delicatula Lx. Cret. and Tert. Fl., p. 168, pl. xxxiii, f. 15, 16, 1883.

Green River group: Florissant, Colorado.

PINITES Witham. Int. Struct. Foss. Veg., p. 72, 1833.

Pinites palæostrobus Ett.=Pinus palæostrobus.

Pinites pannonicus (Ung.) Göpp. Abhandl. d. Schles, Gesell. 1861, heft ii, p. 203, 1861.

Peuce pannonica Ung. Syn. Pl. Foss., p. 208, 1845.

Eocene?: Unga Island, Alaska.

PINUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Pinus anthraciticus Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 89, f. (in text) 10, 1892 [1893].

Kootanie: Anthracite, British Columbia.

Pinus Armstrongi Heer. Fl. Foss. Arct., vol. i, p. 134, pl. xx, f. 19, 1868.

Miocene?: Banks Land.

Pinus Bathursti Heer. Fl. Foss. Arct., vol. i, p. 134, pl. xx, f. 14, 1868.

Miocene?: Bathurst Island.

Pinus Florissanti Lx Cret. and Tert. Fl., p. 138, pl. xxi, f. 13, 1883.

Green River group: Florissant, Colorado.

Pinus MacClurii Heer. Fl. Foss. Arct., vol. i, p. 134, pl. xx, f. 16–18; xxxv, f. 1; xxxvi, f. 1–5, 1868; Cramer in Heer's Fl. Foss. Arct., vol. i, p. 170, pl. xxxv, f. 1; xxxvi, f. 1–5, 1868.

Miocene?: Banks Land.

Pinus (Cyclopitus) Nordenskiöldi Heer. Fl. Foss. Arct., vol. iv, abt. i, p. 45, pl. ix, f. 1–6, 1876; Dn., Trans. Roy. Soc. Canada, vol. x, p. 88, f. (in text) 9, 1892 [1893].

Kootanie: Anthracite, British Columbia.

Pinus palæostrobus? (Ett.) Heer. Fl. Tert. Helv., vol, i, p. 56, pl. xxi. f. 6, 1855; Lx., Tert. Fl., p. 83, pl. vii, f. 25, 31, 1878.

Pinites palæostrobus Ett. Tert. Fl. v. Häring in Tirol, p. 35, pl. vi, f. 22–23, 1853.

Pinus polaris Heer. Fl. Foss. Arct., vol. i, p. 157, pl. xxxi, f. 4*b*, 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 410, 1873 [1874].

Green River group: Florissant, Colorado.

Pinus polaris Heer Lx. [1873]=Pinus palæostrobus.

Pinus Quenstedti Heer. Neue Denkschr. Schw. Ges., vol. xxiii, p. 13, pl. ii, f. 5, 9; pl. iii, 1869; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 392, 1875 [1876]; Cret. and Tert. Fl., p. 33, pl. i, f. 3, 4, 1883.

Dakota group: Kansas.

Pinus strobus L. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 67, 72, 1896.

Pleistocene: New Brunswick.

Pinus susquaensis Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 23, pl. iii, f. 36, 1882 [1883].

Cretaceous: Susqua River, Northwest Territory.

Kootanie: Martin Creek, Coal Creek, and Crows Nest Pass, British Columbia.

Pinus trunculus Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 78, f. (in text) 5, 1890.

———: Tranquille River, British Columbia.

Pinus sp., Font. Proc. U. S. Nat. Mus., vol. xvi, p. 269, pl. xxxvi, f. 11, 1893.

Trinity division: Glenrose, Texas.

Pinus sp., Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 31, pl. i, f. 13, 19, 20, 22, 1892.

Cretaceous: Staten Island.

Pinus sp., Heer. Fl. Foss. Alask., p. 23, pl. i, f. 11, 1869.

Eocene?: Port Graham, Alaska.

Pinus sp., Lx. Geol. and Nat. Hist. Survey Minn., vol. iii, p. 10, 1893.

Dakota group: New Ulm, Minnesota.

Pinus? sp., Dn. Trans. Roy. Soc. Canada, vol. v. sec. iv, p. 34, 1887. [Fossil wood.]

Upper Laramie group: Mackenzie River?

Pinus sp.? Newby. Fl. Amboy Clays, p. 47, pl. ix, f. 5–8, 17, 18, 1895 [1896].

Amboy clay: No location.

Pinus sp. Heer. Fl. Foss. Arct., vol. i, p. 136, pl. xxi, f. 9, 1868.

Miocene?: Mackenzie River.

Pinus sp., Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii; p. 722, pl. cxix, f. 3, 1898.

Payette formation: Idaho City, Idaho.

PIPER Linnæus. Gen., ed. i, p. 333, 1737.

Piper Heerii Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 44, 1888.

Denver group: Golden, Colorado.

PISONIA Plumier. Ex L., Gen., ed. i, p. 42, 1737.

Pisonia racemosa Lx. Ann. Rept. U. S. Geol. and Georg. Surv. Terr., p. 400, 1873 [1874]; Tert. Fl., p. 209, pl. xxxv, f. 4, 1878.

Laramie group: Black Buttes, Wyoming.

PISTACIA Linnæus. Hort. Cliff, p. 456, 1737.

Pistacia oblanceolata (Lx.) n. comb.

Ficus oblanceolata Lx. Ann. Rept. U. S. Geol. and Georg. Surv. Terr., p. 387, 1872 [1873]; Tert. Fl., p. 194, pl. xxviii, f. 9–12, 1878.

Laramie group: Erie, Colorado; Black Buttes, Wyoming.

PISTIA Linnæus. Gen., ed. i, p. 275, 1737.

Pistia corrugata Lx. Ann. Rept. U. S. Geol and Geogr. Surv. Terr., p. 299, 1874 [1876]; Tert. Fl., p. 103, pl. lxi, f. 1, 3, 4, 6, 7, 9–11, 1878.

Montana formation: Point of Rocks, Wyoming.

Belly River series: Medicine Hat.

PITYOXYTON Kraus. In Schimper Pal. Vég., vol. ii, p. 377, 1870.

Pityoxylon fallax Felix. Zeitschr. d. Deutsch. geol. Gesell. Jahr. 1896, p. 254, 1896.

Eocene: Yanceys, Yellowstone National Park.

Pityoxylon Hollicki Kn. In Hollick, Trans. N. Y. Acad. Sci., vol. xvi, p. 134, figs. [in text] 1, 2, 1897.

Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Pityoxylon inæquale Felix. Zeitschr. d. Deutsch. geol. Gesell. Jahrg. 1886, p. 483, pl. xii, f. 3, 1886.

Eocene?: Danaaku, Alaska.

Pityoxylon Krausei Felix. Zeitschr. d. Deutsch. geol. Gesell. Jahrg. 1886, p. 486, pl. xii, f. 1, 2, 1886.

Fort Union group: Little Missouri, Dakota.

Pityoxylon Pealei Kn. Bull. Torr. Bot. Club, vol. xxiii, p. 251, pl. cclxxi, 1896.

Miocene: Upper Galletin Basin, Montana.

Pityoxylon sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]

Belly River series: West of Medicine Hat.

PLANERA Gmelin. Syst., p. 150, 1791.

Planera aquatica (Walt.) Gmel. Syst. Nat., vol. ii, p. 150, 1791; Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.

Planera Gmelini Mx. Fl. Bor. Am., vol. ii, p. 248, 1803; Lx., Am. Journ. Sci., vol. xxvii, p. 365, 1859.

Pleistocene: Banks of Mississippi River, near Columbus, Kentucky.

Miocene?: Bridgeton, New Jersey.

Planera crenata Newby. Proc. U. S. Nat. Mus., vol. v, p. 508, 1882 [1883].

Tertiary: Tongue River, Wyoming.

Planera dubia Lx.=Planera Ungeri.

Planera Gmelini Mx. Lx.=Planera aquatica.

Planera Knowltoniana Hollick in Newby. Fl. Amboy Clays, p. 69, pl. xlii, f. 1–4, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Planera longifolia Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. p. 371, 1872 [1873]; Tert. Fl., p. 189, pl. xxvii, f. 4–6, 1878.
Quercus semi-elliptica Göpp. Lx., Ann. Rept., p. 286, 1871 [1872].
Green River group: Elko Station, Nevada; Florissant, Colorado.
Eocene?: North Fork Similkameen River, British Columbia.

Planera longifolia myricæfolia Lx. Cret. and Tert. Fl., p. 161, pl. xxix, f. 15–27, 1883.
Green River group: Florissant, Colorado.

Planera microphylla Newby. Later Extinct Floras, p. 55, 1868.
Fort Union group: Fort Union, North Dakota.

Planera nervosa Newby. Proc. U. S. Nat. Mus., vol. v, p. 508, 1882 [1883].
Eocene: Green River, Wyoming.

Planera Ungeri Ett. Foss. Fl. v. Wien., p. 14, pl. ii, f. 5–18, 1851; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 387, 1875 [1876]; Ann. Rept. loc. cit., p. 313, 1874 [1876]; Tert. Fl., p. 190, pl. xxvii, f. 7, 1878.
Planera dubia Lx. Am. Journ. Sci., vol. xxviii, p. 361, 1859.
Planera longifolia? Lx. Ann. Rept., op. cit., p. 371, 1872 [1873].
Miocene: John Day Valley, Oregon.
Green River group: Florissant, Colorado.
Eocene: Port Graham, Alaska; Bellingham Bay?

Planera variabilis Newby. Proc. U. S. Nat. Mus., vol. v, p. 508, 1882, [1883].
Eocene: Green River, Wyoming.

PLATÆANTHUS Newberry. Fl., Amboy Clays, p. 125, 1895 [1896].

Platæanthus (Williamsonia) problematicus Newby. Fl., Amboy Clays, p. 125, pl. xxxv, f. 1–9, 1896.
Amboy clay, New Jersey.

PLATANINIUM Unger. In Endlicher Gen. Pl., suppl. ii, p. 101, 18—. [Not seen.]

Plataninium Haydeni Felix. Zeitschr. d. Deutsch. geol. Gesell., Jahr 1896, p. 251, 1896.
Miocene: Amethyst Mountain, Yellowstone National Park.

PLATANOPHYLLUM Fontaine. Potomac Fl., p. 316, 1889.

Platanophyllum crassinerve Font. Potomac Fl., p. 316, pl. clviii, f. 5, 1889.
Potomac formation: Deep Bottom, Virginia.

PLATANUS (Tournefort) Linnæus. Hort. Cliff, p. 447, 1737.

Platanus aceroides Göpp. Zeit. Deutsch. Geol., Gesell., vol. iv., p. 492, 1852; Lx., Am. Journ. Sci., vol. xlv, 2d ser., p. 206, 1869; Tert. Fl., p. 184, pl. xxv, f. 4–6, 1878.
Fort Union group: Bad Lands, Dakota.
Livingston beds: Bozeman coal field, Montana.
Denver group: Golden, Colorado.
Denver group?: Carbon, Wyoming.
Laramie group: Black Buttes, Wyoming.
Miocene: John Day Valley, Oregon; Mackenzie River.

Platanus aceroides latior Lx. = Platanus latior.
Platanus affinis Lx. = Cissites affinis.
Platanus affinis ampla Dn. = Cissites affinis ampla.

Platanus appendiculata Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 12, pl. iii, f. 1–6; pl. vi, f. 7*b*, 1878.
Miocene: Chalk Bluffs, California.

Platanus aquehongensis Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 32, pl. iv, 1892.
Cretaceous: Staten Island.

Platanus aspera Newby. Proc. U. S. Nat. Mus., vol. v, p. 509, 1882 [1883].
Miocene?: Bridge Creek, Oregon.

Platanus basilobata Ward. Bull. U. S. Geol. Surv., p. 35, pl. xvii, f. 1; xviii, f. 1–3, 3*a*; xix, f. 1, 1887.
Fort Union group: Seven-Mile and Clear Creeks, Montana.

Platanus cissoides Lx. Fl. Dak. Gr., p. 75, pl. lxi, f. 3, 1892
Dakota group: Kansas.

Platanus cordata nom. nov.
Quercus platania Heer. Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 386, 1872 [1873]; Tert. Fl., p. 160, pl. xxi, f. 1, 1878.
Eocene?: Cherry Creek, Oregon.
Laramie group?: Carbon, Wyoming.

Platanus diminutiva Lx. Cret. Fl., p. 73, pl. viii, f. 5, 1874.
Platanus diminutivus Lx. Am. Journ. Sci., vol. xlvi, p. 98, 1868.
Dakota group: Nebraska?

Platanus dissecta Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 13, pl. vii, f. 12; pl. x, f. 4, 5, 1878. Cret. and Tert. Fl., p. 249, pl. lvi, f. 4; pl. lvii, f. 1–2, 1883.
Miocene: Chalk Bluffs, Table Mountain, Corral Hollow, and Spanish Peak, California.

Platanus Guillelmæ Göpp. Zeitschr. Deutsch. Geol. Gesel., vol. iv, p. 492, 1852. Tert. Fl. v. Schossnitz, p. 21, pl. xi, f. 1, 2, 1855; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 289, 1871 [1872]; Tert. Fl., p. 183, pl. xxv, f. 1–3, 1878.
Fort Union group: Yellowstone River, Montana; Bad Lands, Dakota.
Denver group: Golden, Colorado.
Denver group?: Carbon, Wyoming.
Eolignitic: McLees, Louisiana.

Platanus Haydenii Newby. Later Extinct Floras, p. 70, 1868; Ill. Cret. and Tert. Pl., pls. xix, xx, xxi, f. 1, 1883 [1884].
Fort Union group: Yellowstone River, Montana; Bow River.
Denver group: Sedalia and Golden, Colorado.
Laramie group?: Sand Creek, Colorado.

Platanus Heerii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 303, 1871 [1872]; Cret. Pl., p. 70, pl. viii, f. 4; ix, f. 1, 2, 1874; Rept. on Clays in N. J., p. 29, 1878.
Dakota group: Salina River, Kansas.
Amboy clay: Washington, New Jersey.
Mill Creek series: Mill Brook.

Platanus heterophyllus Newby. Dn., Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 330, 1875.
Lignite Tertiary: Wood End, Canada.

Platanus integrifolia Lx. = Platanus Raynoldsii integrifolia.

Platanus latiloba Newby. Later Extinct Floras, p. 23, 1868.
Dakota group: Blackbird Hill, Nebraska.

Platanus latior (Lx.) n. comb.
Platanus primæva Lx. Cret. Fl., p. 69, pl. vii, f. 2; pl. xxvi, f. 2, 1874; Fl. Dak. Gr., p. 72, pl. viii, f. 7, 8*b*; x, f. 1, 1892.
Platanus aceroides? Göpp., var. latior Lx. Am. Journ. Sci., vol. xlvi, p. 97, 1868.
Dakota group: Nebraska, Kansas, and Minnesota.

Platanus latior grandidentata (Lx.) n. comb.
Platanus primæva grandidentata Lx. Fl. Dak. Gr., p. 73, pl. ix, f. 1, 2, 1892.
Dakota group: Kansas.

Platanus latior integrifolia (Lx.) n. comb.
Platanus primæva integrifolia Lx. Fl. Dak. Gr., p. 74, pl. xlix, f. 4, 1892.
Dakota group: Kansas.

Platanus latior subintegrifolia (Lx.) n. comb.
Platanus primæva subintegrifolia Lx. Fl. Dak. Gr., p. 73, pl. ix, f. 3, 4, 1892.
Dakota group: Kansas.

Platanus marginata (Lx.) Heer. Fl. Foss. Arct., vol. vii, p. 97, pl. xcviii, f. 3–5; pl. xcix, f. 2, 3; pl. ci, f. 5, 1883.
Viburnum marginatum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 395, 1872 [1873]; Tert. Fl., 223, pl. xxxvii, f. 11; pl. xxxviii, f. 1, 4. [Non 2, 3, 5] 1878.
Denver group: Golden, Colorado.
Laramie group: Black Buttes and Point of Rocks, Wyoming.

Platanus Newberrii Lx. = Platanus Newberryana.

Platanus? Newberryana Heer. Phyl. Crét. d. Nebr., p. 16, pl. i, f. 4, 1866.
Platanus Newberrii Lx. Am. Journ. Sci., vol. xlvi, p. 97, 1868.
Dakota group: Beatrice, Nebraska, etc.

Platanus nobilis Newby. Later Extinct Floras, p. 67, 1868; Dn., Trans. Roy. Soc. Canada, vol. iv., sec. iv, p. 24, pl. i, f. 7, 1886 [1887].
Fort Union group: Seven-Mile Creek, Montana.
Upper Laramie group: Calgary, Canada; Souris River, British Columbia.
Miocene: John Day Valley, Oregon.

Platanus occidentalis L. Knowlton, Am. Geol., vol. xviii, p. 371, 1896; Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 68, 72, 1896.
Glacial: Morgantown, West Virginia.
Pleistocene: Don Valley, Toronto.

Platanus obtusiloba Lx. Am. Journ. Sci., vol. xlvi, p. 97, 1868.
Dakota group: Beatrice, Nebraska.

Platanus platanoides (Lx.) n. comb.

Viburnum platanoides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 314, 1874 [1876]; Tert. Fl., p. 224, pl. xxxviii, f. 8, 9, 1878.

Laramie group: Black Buttes, Wyoming.

Platanus primæva Lx.= Platanus latior.

Platanus primæva grandidentata Lx.= Platanus latior grandidentata.

Platanus primæva integrifolia Lx.= Platanus latior integrifolia.

Platanus primæva subintegrifolia Lx.= Platanus latior subintegrifolia.

Platanus Raynoldsii Newby. Later Extinct Floras, p. 69, 1868; Lx., Tert. Fl., p. 185, pl. xxvi, f. 4, 5; pl. xxvii, f. 1–3, 1878.

Fort Union group: Montana.

Upper Laramie group: Canada.

Denver group: Golden, Colorado.

Miocene?: ?John Day Valley, Oregon.

Platanus Raynoldsii integrifolia Lx. Tert. Fl., p. 185, 1878.

Platanus integrifolia Lx. MSS. in Lx., Tert. Fl., p. 185, 1878.

Denver group: Golden, Colorado.

Laramie group: Black Buttes, Wyoming.

Platanus recurvata Lx.=Sassafras recurvatum.

Platanus rhomboidea Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 400, 1873 [1874]; Tert. Fl. 186, pl. xxvi, f. 6, 7, 1878.

Viburnum anceps Lx. Tert. Fl., p. 227, pl. xxxviii, f. 11, 1878.

Denver group: Golden, Colorado.

Platanus? sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]

Belly River series: Ribstone Creek.

Platanus sp., Cragin. Bull. Washburn College Laboratory, vol. ii, no. 10, p. 66, 1889.

Cretaceous: Cimarron Valley, south of Mead County, Kansas.

Platanus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 142, 1897.

Laramie?: Dutton Creek coal, Wyoming.

PLATYPTERYGIUM Schimper. In Zittel Handb. Pal., vol. ii, p. 225, 1880.

Platypterygium densinerve Font. Potomac Fl., p. 169, pl. xxx, f. 8; xxxi, f. 1, 4; xxxii, f. 1, 2; xxxiii, f. 1; xxxiv, f. 1; xxxv, f. 1, 2, 1889.

Potomac formation: Fredericksburg, Virginia.

Platypterygium Rogersianum Font. Potomac Fl., p. 171, pl. xxxi, f. 2; xxxiii, f. 2; xxxiv, f. 2, 1889.

Potomac formation: Fredericksburg, Virginia.

POACITES Brongniart. Prod. Hist. Vég. Foss., p. 137, 1828.

Poacites lævis Al. Br. In Stizenberger, Uebersicht d. Vers. d. Baden, p. 74, 1851; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 285, 1871 [1872].

Green River group: Barrel Springs, Wyoming.

Poacites Mengeanus Heer. Mioc. balt. Fl., p. 59, pl. xv, f. 2–11, 1859; Lesquereux, Proc. U. S. Nat. Mus., vol. x. p. 35, 1887.
Pliocene?: Clear Lake, California

Poacites tenue-striatus Heer. Fl. Foss., Alask., p. 24, pl. i, f. 14, 1869.
Eocene?: Port Graham, Alaska.

PODOCARPITES Andræ. Abh. der k. k. geol. Reichsanst., vol. ii, abt. iii p. 45, 1853.

Podocarpites Tyrrellii Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 35, 1887.
Belly River series: Vermilion River.

PODOCARPUS (L'Heritier) Persoon. Syn., vol. ii, p. 580, 1807

Podocarpus eocenica? Ung. Foss. Fl. v. Sotzka, p. 28 [158], pl. ii, [xxii], f. 11–16, 1850; Lx., Cret. and Tert. Fl., p. 140, 1883.
Green River group: Florissant, Colorado.

PODOGONIUM Heer. Fl. Tert. Helv., vol. iii, p. 113, 1859.

Podogonium acuminatum Lx. Cret. and Tert. Fl., p. 201, 1883.
Green River group: Florissant, Colorado.

Podogonium americanum Lx. Tert. Fl., p. 288, pl. lix, f. 5; pl. lxiii, f. 5; pl. lxv, f. 6, 1878.
Podogonium sp.? Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 417, 1873 [1874].
Laramie group: Black Buttes, Wyoming.
Montana formation: Point of Rocks, Wyoming.

Podogonium sp., Lx. = Podogonium Americanum.

PODOZAMITES Fr. Braun in Münster Beiträge z. Petrefacten-Kunde, vol. ii, heft vi, p. 28, 1843.

Podozamites acuminatus Hollick in Newberry. Fl. Amboy Clays, p. 45, pl. xiii, f. 7, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Podozamites acutifolius Font. Potomac Fl., p. 181, pl. lxxx, f. 6; lxxxv, f. 10, 15; lxxxvii, f. 1, clxx, f. 2, 1889.
Potomac formation: Near Dutch Gap Canal, Deep Bottom, near Telegraph Station, and near Brooke, Virginia.
Trinity division: Glenrose, Texas.

Podozamites angustifolius (Eichw.) Schimp. Pal. Vég., vol. ii, p. 160, 1870; Lx., Cret. and Tert. Fl., p. 28, 1884; Newby., Fl. Amboy Clays, p. 44, pl. xiii, f. 1–4, 1895 [1896].
Dakota group: Kansas.
Amboy clay: Woodbridge, New Jersey.

Podozamites caudatus Lx. = Dammarites caudatus.

Podozamites distantinervis Font. Potomac Fl., p. 179, pl. lxxix, f. 9; lxxxii, f. 4; lxxxiii. f. 1, 2. 6, 7: lxxxiv. f. 1, 2, 8, 10, 14, 15; lxxxv, f. 12, 16, 1889.
Potomac formation: Near Potomac Run, Fredericksburg, and near Telegraph Station, Virginia.

Podozamites emarginatus Lx. = Dammarites emarginatus.

Podozamites grandifolius Font. Potomac Fl., p. 180, pl. lxxxiii, f. 2; lxxxiii, f. 5, 1889.

Potomac formation: Fredericksburg, and near Potomac Run, Virginia.

Podozamites Haydenii Lx. Cret. and Tert. Fl., p. 27, 1883.

Pterophyllum Haydenii Lx. Am. Journ. Sci., vol. xlvi, p. 91, 1868; Cret. Fl., p. 49, pl. i, f. 6, 6*b*, 1878.

Dakota group: Decatur, Nebraska.

Podozamites lanceolatus (L. and H.) Schimp. Pal. Vég., vol. ii, p. 160, 1870; Lx., Fl. Dak. Gr., p. 28, pl. i, f. 5, 6, 1891; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 6, pl. i, f. 3, 1885 [1886].

Zamia lanceolata L. and H. Foss. Fl., vol. iii, pl. 193, 1836.

Kootanie: Martin Creek; Kootanie Pass., etc, British Columbia.

Dakota group: Kansas.

Podozamites latipennis Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 42, pl. xiv, f. 1–9; xv, f. 2*a*, 3*b*, 1884; Weed, Bull. Geol. Soc. Am., vol. iii, p. 323, 1892. [Doubtful.]

Kootanie: Sun River, Montana.

Podozamites marginatus? Heer. Fl. Foss. Arct., vol. vi., abt. ii, p. 43, pl. xvi, f. 10, 1882; Fl. Amboy Clays, p. 44, pl. xiii, f. 5, 6, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Podozamites nervosa Newby. Am. Journ. Sci., vol. xli, p. 200, pl. xiv, f. 6, 1891.

Kootanie: Great Falls, Montana.

Podozamites oblongus Lx. Cret. and Tert. Fl., p. 28, pl. i, f. 10, 11.

Dakota group: Kansas.

Podozamites pedicellatus Font. Potomac Fl., p. 180, pl. lxxvi, f. 1; lxxviii, f. 7; lxxxii, f. 5, 1889.

Potomac formation: Fredericksburg, Virginia.

Podozamites prælongus Lx.=Dammarites caudatus.

Podozamites stenopus Lx. Fl. Dak. Gr., p. 27, pl. i, f. 7, 1891.

Dakota group: Kansas.

Podozamites subfalcatus Font. Potomac Fl., p. 179, pl. lxviii, f. 6; clxx, f. 9, 1889.

Potomac formation: Near Brooke, Virginia.

Podozamites tenuinervis Heer. Fl. Foss. Arct., vol. vi., abt. ii, p. 44, pl. xvi, f. 9, 1882; Newby., Bull. Torr. Bot. Club, vol. xiii. p. 35, 1886.

Amboy clay: New Jersey.

Podozamites sp., Font. Proc. U. S. Nat. Mus., vol. xvi, p. 267, pl. xxxvi, f. 8, 1893.

Trinity division: Glenrose, Texas.

Pollen sacs? Font. Potomac Fl., p. 272, pl. cxxxvi, f. 7, 1889.

Potomac formation: Virginia.

POLYPODIUM (Tournefort) Linnæus. Gen. Pl., p. 322, 1737.

Polypodium dentatum Font. Potomac Fl., p. 105, pl. xxii, f. 4, 5, 1889.

Potomac formation: Fredericksburg, Virginia.

Polypodium fadyenioide Font. Potomac Fl., p. 104, pl. xvi, f. 4, 5, 1889.

Potomac formation: Near Potomac Run, Virginia.

POPULITES Lesquereux. Am. Journ. Sci., vol. xlvi., p. 93, 1868.

Populites affinis Lx. = Cissites affinis.

Populites cyclophylla (Heer) Lx. Am. Journ. Sci., vol. xlvi, p. 93, 1868; Cret. Fl., p. 59, 1874; Fl. Dak. Gr., p. 48, 1891.

Populus cyclophylla Heer. Proc. Acad. Nat. Sci., Phila., vol. x, p. 266, 1858.

Cissites cyclophylla Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 353, 1874 [1876].

Dakota group: New Ulm, Minnesota; Lancaster and Decatur, Nebraska; Peace River, Northwest Territory.

Populites elegans Lx. Am. Journ. Sci., vol. xlvi, p. 94, 1868; Geol. and Nat. Hist. Surv. Minn. iii, p. 10, pl. A, f. 2; pl. B, f. 1, 1893.

Dakota group: Decatur, Nebraska; New Ulm, Minnesota.

Populites fagifolia Lx. = Grewiopsis flabellata.

Populites flabellata Lx. = Grewiopsis flabellata.

Populites lancastriensis Lx. Cret. Fl., p. 58, pl. vii, f. 1, 1874.

Populus lancastriensis Lx. Am. Journ. Sci., vol. xlvi, p. 93, 1868.

Dakota group: Lancaster, Nebraska; New Ulm, Minnesota.

Populites litigiosus (Heer) Lx. Fl. Dak. Gr., p. 46, pl. vii, f. 7· pl. viii, f. 5; pl. xlvi, f. 6; pl. xlvii, f. 1, 1891.

Populus litigiosa Heer. Phyll. Crét. d. Nebr., p. 13, pl. i, f. 2, 1866.

Dakota group: Kansas; New Ulm, Minnesota.

Populites microphyllus Lx. Trans. Am. Phil. Soc., vol. xiii, p. 430, pl. xxiii, f. 2, 3, 1869.

Dakota group: Kansas.

Populites ovata Lx. = Ampelophyllum ovatum.

Populites probalsamifera Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 57, pl. vii, f. 23, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver.

Populites quadrangularis Lx. = Hamamelites quadrangularis.

Populites salinæ Lx. = Menispermites salinæ.

Populites salisburiæfolius Lx. = Cissites salisburiæfolius.

Populites Sternbergii Lx. Fl. Dak. Gr., p. 45, pl. vii, f. 8, 9, 1891.

Dakota group: Kansas.

Populites Winchelli Lx. Geol. and Bot. Hist. Surv. Minn., vol. iii, p. 12, pl. B, f. 2, 1893.

Dakota group: New Ulm, Minnesota.

POPULOPHYLLUM Fontaine. Potomac Fl., p. 311, 1889.

Populophyllum crassinerve Font. Potomac Fl., p. 312, pl. clviii, f. 4, 1889.

Potomac formation: Deep Bottom, Virginia.

Populophyllum hederæforme Font. Potomac Fl., p. 311, pl. clxvi, f. 3, 1889.

Potomac formation: Virginia.

Populophyllum reniforme Font. Potomac Fl., p. 311, pl. clv, f. 9; clvi, f. 3, 1889.

Potomac formation: Near Brooke, Virginia.

POPULUS Linnæus. Syst., ed. i, 1735.

Populus acerifolia Newby. Later Extinct Floras, p. 65, 1868; Ill. Cret. and Tert. Pl., pl. xiii, f. 5–8, 1878.

Fort Union group: Yellowstone River, Montana.

Canadian upper Laramie: Canada; Souris River, etc.

Populus æqualis Schimp. = Populus lævigata.

Populus amblyrhyncha Ward. Bull. U. S. Geol. Surv., no. 37, p. 20, pl. vi, f. 1–8; vii, f. 1–3, 1887.

Fort Union group: Seven-Mile Creek, Montana.

Populus anomala Ward. Bull. U. S. Geol. Surv., no. 37, p. 23, pl. viii, f. 7, 1887.

Fort Union group: Burns's Ranch, Montana.

Populus? apiculata Newb. In MSS. Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 31, pl. iii, f. 2, 1892; Newby., Fl. Amboy Clays, p. 65, pl. xv, f. 3, 4, 1895 [1896].

Cretaceous: Staten Island.

Amboy clay: Woodbridge, New Jersey.

Populus arctica Heer. Fl. Foss. Arct., vol. i, p. 100, pl. iv, f. 6*a*, 7; pl. v; pl. vi, f. 5, 6; pl. viii, f. 5, 6; pl. xvii, f. 5 f. e.; op. cit., p. 137, pl. xxi, f. 14, 15*a*, 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 289, 300, 1871 [1872]; Tert. Fl., p. 178, pl. xxiii, f. 1–6, 1878.

Populus decipiens Lx. Ann. Rept., op. cit., p. 385, 1872 [1873]; Tert. Fl., p. 179, pl. xxiii, f. 7–11, 1878.

From Laramie to Miocene: Abundant.

Miocene?: Mackenzie River; Great Valley; Souris River.

Populus aristolochioides Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 393, 1875.

Dakota group: Kansas.

Populus attenuata Al. Br. Lx. = Populus subrotunda.

Populus auriculata Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 356, pl. iv, f. 4, 1895.

Potomac formation: Mount Vernon, Virginia.

Populus balsamifera L. Sp. Pl., ed. i, vol. ii, p. 1034, 1753; Dn., Can. Nat., vol. ii, p. 422, 1857; op. cit., new ser., vol. iii, p. 72, f. 2–4, 1868; Geol. Hist. Pl., p. 228, f. 78, 1888; Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 64, 72, 1896.

Pleistocene: Greens Creek and Bessierer's Wharf, Ottawa River.

Populus balsamoides Göpp. Tert. Fl. v. Schossnitz, p. 23, pl. xv, f. 5, 6, 1855; Heer, Fl. Foss. Alask., p. 26, pl. ii, f. 3, 1869; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 299, 1871 [1872].

Eocene?: Port Graham and near Litho, Alaska; Yellowstone Lake.

Miocene: Corral Hollow, California.

Populus balsamoides eximia (Göpp.) Lx. Cret. and Tert. Fl., p. 226, pl. xlviA, f. 10, 1883.

Populus eximia Göpp. Tert. Fl. v. Schossnitz, p. 23, 1855.

Fort Union group: Bad Lands, Dakota.

Populus balsamoides? Göpp., var. **latifolia** Lx. Cret. and Tert. Fl., p. 158, pl. xxxi, f. 4, 1883.

Green River group: Florissant, Colorado.

Populus Berggreni Heer. Öfversigt. K.Vetenskaps-Akad. Förhandl., 1871, p. 1183, 1871; Lx., Fl. Dak. Gr., p. 42, pl. viii, f. 2–4, 1891.

Dakota group: Kansas; New Ulm, Minnesota.

Populus cordata Newby. Later Extinct Floras, p. 60, 1868; Ill. Cret. and Tert. Pl., pl. xiv, f. 6, 1878.

Fort Union group: Yellowstone River, Montana.

Populus cordifolia Newby. Later Extinct Floras, p. 18, 1868; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 17, 1885 [1886].

Dakota group: Nebraska.

Upper Laramie group: Canada.

Populus craspedodroma Ward. Bull. U. S. Geol. Surv., no. 37, p. 21, pl. viii, f. 3, 1887.

Fort Union group: Clear Creek, Montana.

Populus cuneata Newby. Later Extinct Floras, p. 64, 1868; Ill. Cret. and Tert. Pl., pl. xiv, f. 1–4, 1878.

Fort Union group: Yellowstone River, Montana; Bad Lands, Dakota.

Populus cyclophylla Heer = Populites cyclophyllus.

Populus daphnogenoides Ward. Bull. U. S. Geol. Surv., no. 37, p. 20, pl. vii, f. 4–6, 1887.

Fort Union group: Seven-Mile Creek, Montana.

Eocene?: Similkameen Valley, British Columbia.

Populus? Debeyana Heer = Juglans Debeyana.

Populus decipiens Lx. = Populus arctica.

Populus denticulata Heer. Fl. Foss. Arct., vol. vii, p. 20, pl. lv, f. 5, 1883; Lesquereux, Proc. U. S. Nat. Mus., vol. x, p. 40, 1887.

——— : Upper Kanab Valley, Utah.

Populus elliptica Newby. Later Extinct Floras, p. 16, 1868.

Dakota group: Blackbird Hill, Nebraska.

Populus eotremuloides Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 725, pl. c, f. 1, 2; ci, f. 1, 2, 1898.

Payette formation: Marsh, Idaho.

Populus flabellum Newby. Bost. Journ. Nat. Hist., vol. vii, p. 524, 1863.

———: Bellingham Bay, Washington.

Populus genatrix Newby. Later Extinct Floras, p. 64, 1868; Dn., Trans. Roy. Soc., Canada, vol. iii, sec. iv, p. 17, 1885 [1886].

Fort Union group: Yellowstone River, Montana.

Canadian upper Laramie: North Saskatchewan; Souris River, Great Valley; Canada.

Populus glandulifera Heer. Fl. Tert. Helv., vol. ii, p. 17, pl. lviii, f. 5–11; pl. lxviii, f. 7 1856; Cret. and Tert. Fl., p. 226, pl. xlviA, f. 3, 4, 1883.
Eocene?: Fort Graham, Alaska.
Fort Union group: Montana; Bad Lands, Dakota.
Miocene: John Day Valley, Oregon.

Populus grandidentata Mx. Flor. Bor. Am., vol. ii, p. 243, 1803; Penhallow, Bull. Geol. Soc. Am., vol. i, p. 326, 1890.
Pleistocene: Greens Creek, Ottawa River; Montreal, Canada.

Populus Grewiopsis Ward. Bull. U. S. Geol. Surv., no. 37, p. 23, pl. ix, f. 1, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Populus harkeriana Lx. Fl. Dak. Gr., p. 44, pl. xlvi, f. 4, 1892.
Dakota group: Fort Harker, Kansas.

Populus hederoides Ward. Bull. U. S. Geol. Surv., no. 37, p. 22, pl. viii, f. 5, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Populus Heerii Sap. Ann. d. Sci. Nat., 4th ser., vol. xvii, p. 87, pl. vii, f. 3, 1863; Lx.. Cret. and Tert. Fl., p. 157, pl. xxx, f. 1–8; pl. xxxi, f. 11, 1883.
Green River group: Florissant, Colorado.

Populus Heliadum Ung. Lx., 1873=Populus Ungeri.

Populus Hookeri Heer. Fl. Foss. Arct., vol. i, p. 137, pl. xxi, f. 16, 1868; Dn., Trans. Roy. Soc. Canada, vol. vii, sec. iv, p. 71. pl. x, f. 5, 1889.
Miocene?: Mackenzie River.

Populus hyperborea Heer. Fl. Foss. Arct., vol. iii, pt. ii, p. 106, 1873; Lx., Fl. Dak. Gr., p. 43, pl. iii, f. 9–11; pl. viii, f. 1; pl. xlvii. f. 5. 1892.
Dakota group: Kansas.

Populus inæqualis Ward. Bull. U. S. Geol. Surv., no. 37, p. 24, pl. ix, f. 2, 1887.
Fort Union group: Burns's Ranch, Montana.

Populus kansaseana Lx. Fl. Dak. Gr., p. 42, pl. xvii, f. 1–7, 1892.
Dakota group: Kansas.

Populus Knightii Kn. Bull. Geol. Soc. Am., vol. viii, p. 142, 1897.
Laramie group?: Dutton Creek coal, Wyoming.

Populus lævigata Lx. Am. Journ. Sci., vol. xlv, 2d ser., p. 205, 1868; Tert. Fl., p. 175, pl. xxii, f. 9, 1878.
Populus æqualis Schimp. Pal. Vég., vol. ii, p. 693, 1872.
Denver group?: Rock Creek, Laramie Plains, Wyoming.

Populus Lancastrensis Lx. = Populites Lancastrensis.

Populus latidentata Dn. Trans. Roy. Soc? Canada, vol. iii, sec. iv, p. 16, 1885 [1886].
Belly River series: Medicine Hat.

Populus latior Al. Br. In Buckl. Geol., p. 512, 1835?; Heer., Fl. Foss. Alask., p. 25, pl. ii, f. 4, 1869.
Eocene?: Port Graham.

Populus latior cordifolia Heer. Fl. Tert. Helv., vol. ii, p. 12, pl. lv, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 289, 1871 [1872].

Populus latior transversa Heer. Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 287, 1871 [1872].

Laramie group?: Medicine Bow, Wyoming.

Populus latior transversa Heer. = Populus latior cordifolia.

Populus latior truncata Al. Br. In Stizenberger, Uebers., p. 79, 1851; Lx., Cret. and Tert. Fl., p. 226, pl. xlvi, f. 14, 1883.

Fort Union group: Bad Lands, Dakota.

Populus leucophylla Ung. Gen. et Sp. Pl. Foss., p. 417, 1850; Heer, Fl. Foss. Alask., p. 26. pl. iii, f. 4, 5, 1869.

Eocene: Alaska?

Populus Lindgreni Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 725, pl. c. f. 3, 1898.

Payette formation: Marsh, Idaho.

Populus litigiosa Heer = Populites litigiosus.

Populus longior Dn. Trans. Roy. Soc. Canada, vol. i. sec. iv, p. 27, 1882 [1883].

Upper Cretaceous: Nanaimo; Baynes Sound.

Populus Leuce (Rossm.) Ung. Gen. et Sp. Pl. Foss., p. 417, 1850; Heer, Proc. Acad. Nat. Sci. Phila., vol. x, p. 265, 1858.

Dakota group: Kansas?

Populus leucophylla Ung. Gen. et. Sp. Pl. Foss., p. 417, 1850; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 296, 1871 [1872]. [Not afterward recognized by Lesquereux.]

Laramie group?: Spring Canyon, Montana.

Populus Meedsii Kn. Proc. U. S. Nat. Mus., vol. xvi, p. 34, pl. i, f. 1. 2, 1893.

Fort Union group: Glendive?, Montana.

Populus melanaria Heer. Lx. = Populus melanarioides.

Populus melanarioides Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 379, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 302, 1874 [1876]; Tert. Fl., p. 174, pl. lxii, f. 5, 1878.

Populus melanaria Heer Lx. Ann. Rept, op. cit., p. 302, 1874 [1876]; Tert. Fl. p. 173, pl. lxiv, f. 5, 1878.

Montana formation: Point of Rocks, Wyoming.

Populus microphylla Newby. Later Extinct Floras, p. 17, 1868.

Dakota group: Blackbird Hill, Nebraska.

Populus monodon Lx. Trans. Am. Phil. Soc., vol. xiii, p. 413, pl. xv, f. 1, 2, 1869.

Eolignitic: Mississippi.

Populus monodon Lx. [Tert. Fl., pl. xxiv, f. 1, 2] = Populus mutabilis ovalis and Ficus uncata.

Populus mutabilis crenata Heer. Fl. Tert. Helv., vol. ii, p. 21, pl. lx, f. 5, 8, 11, 12*a*, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 386, 1872 [1873]. [Not afterwards referred to by Lesquereux.]

———: Carbon, Wyoming.

Populus mutabilis lancifolia Heer. Fl. Tert. Helv., vol. ii, p. 23, pl. lxi, f. 7, 8, 10, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 296, 1871 [1872]. [Not afterwards recognized by Lesquereux.]

Laramie group?: Spring Canyon, Montana.

Populus mutabilis ovalis Heer. Fl. Tert. Helv., vol. ii, p. 22, pl. i, f. 1, 2; ii, f. 2 *a b*; lxi, f. 1-3, 6, 9; lxiii, f. 4, 1856; Lx., Tert. Fl., p. 177, pl. xxiv, f. 3, 4, 1878.

Populus ovalis? Göpp. Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 292, 1871 [1872].

Populus mutabilis repando-crenata Heer. In Lx., Trans. Am. Phil. Soc., vol. xiii, p. 413, pl. xviii, f. 4-6, 1869.

Ficus ovalis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 313, 1874 [1876].

Populus monodon Lx. Ex. p. Tert. Fl., p. 180, pl. xxiv, f. 2, 1878.

Livingston beds: Spring Canyon, Montana.
Denver group: Golden and Plum Creek, Colorado.
Laramie group: Black Buttes, Wyoming.
Laramie group?: Evanston, Wyoming.
Montana formation: Point of Rocks, Wyoming.

Populus mutabilis repando-crenata Heer=Populus mutabilis ovalis.

Populus nebrascensis Newby. Later Extinct Floras, p. 62, 1868.

Fort Union group: Yellowstone River, Montana.
Denver group: Golden, Colorado.

Populus nebrascensis acute-dentata Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 47, 1888.

Denver group: Golden, Colorado.

Populus nebrascensis grandidentata Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 47, 1888.

Denver group: Golden, Colorado.

Populus nebrascensis longifolia Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 48, 1888.

Denver group: Golden, Colorado.

Populus nebrascensis rotundata Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 47, 1888.

Denver group: Golden, Colorado.

Populus nervosa Newby. Later Extinct Floras, p. 61, 1868.

Fort Union group: Yellowstone River, Montana; North Saskatchewan, Canada.

Populus nervosa elongata Newby. Later Extinct Floras, p. 62, 1868.

Fort Union group: Yellowstone River, Montana.

Populus obtrita Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 82, f. (in text) 12, 1890.
Miocene?: Similkameen Valley, British Columbia.

Populus occidentalis Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 727, pl. xcix, f. 14, 1898.
Payette formation: Marsh, Idaho.

Populus ovalis? Göpp. Lx. [1871]=Populus mutabilis ovalis.

Populus oxyphylla Sap. Ann. Sci. Nat. Bot., 5th ser., vol. viii, p. 73, 1867; Lx., Cret. and Tert. Fl., p. 159, pl. xxxviii, f. 9–11, 1883.
Green River group: Florissant, Colorado.

Populus oxyrhyncha Ward. Bull: U. S. Geol. Surv., no. 37, p. 21, pl. viii, f. 1, 2, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Populus polymorpha Newby. Proc. U. S. Nat. Mus., vol. v, p. 506, 1882 [1883].
Miocene?: Bridge Creek, Oregon.

Populus potomacensis Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 356, pl. iv, f. 1–3, 1895.
Potomac formation: Mount Vernon, Virginia.

Populus? problematica Kn. Bull. U. S. Geol. Surv., no. 105, p. 51, pl. vi, f. 5, 6, 1893.
Laramie group: Head of Fir Canyon, near Bozeman, Montana.

Populus protozadachii Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 26, pl. vii, f. 25, 1882 [1883].
Upper Cretaceous: Newcastle Island.

Populus rectinervata Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 27, pl. vii, f. 26, 1882 [1883].
Upper Cretaceous: Baynes Sound.

Populus rhomboidea Lx. Am. Journ. Sci., vol. xxvii, 2d ser., p. 360, 1859.
Upper Cretaceous: Newcastle Island; Nanaimo, Vancouver Island.
Miocene?: Mackenzie River.
Lignitic Tertiary: Porcupine Creek.

Populus Richardsoni Heer. Fl. Foss. Arct., vol. i, p. 98, pl. iv, f. 1–5, vi, f. 7, 8; xv, f. 1c; 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 411, 1873 [1874]; Tert. Fl., p. 177, pl. xxii, f. 10–12, 1878.
Green River group: Elko Station, Nevada.
Canadian upper Laramie: Calgary, Canada.
Fort Union group: Montana.
Eocene?: Chignik Bay, Alaska.
Miocene: Mackenzie River.

Populus rotundifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 506, 1882 [1883].
Fort Union group: Yellowstone River.

Populus Russelli Kn. Bull. U. S. Geol. Surv., no. 108, p. 104, 1893.
Miocene?: Ellensburg, Washington.

Populus smilacifolia Newby. Later Extinct Floras, p. 66, 1868.
Fort Union group: Fort Union, North Dakota.

Populus speciosa Ward. Bull. U. S. Geol. Surv., no. 37, p. 20, pl. v, f. 4–7, 1887.
Fort Union group: Clear Creek, Montana.

Populus stygia Heer. Fl. Foss. Arct., vol. iii, apt. ii, p. 107, 1873; Lx. Fl. Dak. Gr., p. 44, pl. iii, f. 12, 1892.
Dakota group: Kansas.

Populus subrotunda Lx. Am. Journ. Sci., vol. xlv, p. 205, 1868.
Populus attenuata Al. Br. Lx., Am. Journ. Sci., vol. xlv, p. 205, 1868.
Populus subrotundata Lx. Tert. Fl., p. 173, pl. xxiv, f. 6–8, 1878.
———: Carbon and Evanston, Wyoming; Rock Creek and Laramie Plains, Wyoming; Golden, Colorado?

Populus subrotundata Lx. = Populus subrotunda.

Populus tenuinervata Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 48, 1888.
Denver group: Golden, Colorado.

Populus trinervis Dn. Trans. Roy. Soc., Canada, vol. i, sec. iv, p. 26, 1882 [1883].
Upper Cretaceous: Nanaimo; Baynes Sound.

Populus Ungeri Lx. Tert. Fl., p. 175, pl. xxiv, f. 5, 1878.
Populus Heliadum Ung. Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 397, 1873 [1874].
Denver group: Golden, Colorado.

Populus Whitei Ward. Bull. U. S. Geol. Surv., no. 37, p. 22, pl. viii, f. 4, 1887.
Fort Union group: Burns's Ranch, Montana.

Populus Zaddachi Heer. Fl. Tert. Helv., vol. iii, p. 307, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 292, 1871 [1872]; Cret. and Tert. Fl., p. 158, pl. xxxi, f. 8, 1883.
Eocene?: Port Graham, Alaska.
Miocene: Chalk Bluffs, California.
Green River group: Florissant, Colorado.
Fort Union group: Montana and Dakota.

Populus sp., Dn. Geol. Surv. Canada, Rept. of Progress for 1872–73. Appen. I, p. 68, 1873.
Cretaceous: Vancouver Island, British Columbia.

Populus sp. [Wood], Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, 1875.
Lignitic tertiary: Forty-ninth parallel.

Populus sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]
Fort Pierre series: Head of Swift Current.

Populus sp., Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 27, 1882 [1883].
Upper Cretaceous; Baynes Sound.

Populus sp., Kn. Bull. U. S. Geol. Surv., no. 105, p. 50, pl. vi, f. 7–9, 1893.
Laramie group: Head of Bear Canyon, near Bozeman, Montana.

PORANA Burm. f. Fl. Ired., p. 51, 1768.

Porana Bendirei (Ward) Lx. Proc. U. S. Nat. Mus., vol. xi, p. 16 pl. viii, f. 4, 1888.

Marsilea Bendirei Ward. Fifth Ann. Rept. U. S. Geol. Surv., p. 446, 1883–84 [1885].

Miocene: John Day Valley, Oregon.

Porana Speirii Lx. Cret. and Tert. Fl., p. 172, pl. xxviii, f. 15, 1883.

Green River group: Florissant, Colorado.

Porana tenuis Lx. Cret. and Tert. Fl., p. 173, 1883.

Green River group: Florissant, Colorado.

Porana sp., Lx. Proc. U. S. Nat. Mus., vol. xi, p. 13, 1888.

Eolignitic: Wickliffe, Kentucky.

POTAMOGETON (Tournefort) Linnæus. Syst. ed., i, 1735.

Potamogeton geniculatus Al. Br. Neues Jahrb. 1845, p. 168, 1845; Lx., Cret. and Tert. Fl., p. 142, 1883.

Green River group: Florissant, Colorado.

Potamogeton pectinatus L. Sp. Pl., p. 127, 1753; Penhallow. Trans. Roy. Soc., Canada, 2d ser., vol. ii, sec. iv, p. 66, 72, 1896.

Pleistocene: Besserer's Wharf, Ottawa River.

Potamogeton perfoliatus L. Sp. Pl., p. 126, 1753; Dn., Can. Nat., vol. iii, new ser., p. 72, 1868; Geol. Hist. Pl., p. 229, 1888; Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 65, 72, 1896.

Pleistocene: Besserer's Wharf and Greens Creek, Ottawa River Canada.

Potamogeton pusillus L. Sp. Pl., p. 127, 1753; Dn., Can. Nat., vol. iii, new ser., p. 73, 1868; Geol. Hist. Pl., p. 229, 1888; Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 65, 72, 1896.

Pleistocene: Besserer's Wharf and Greens Creek, Ottawa River, Canada.

Potamogeton rutilans Wolfg. Penhallow=Potamogeton rutilus.

Potamogeton rutilus Wolfg.

Potamogeton rutilans? Wolfg. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 327, 1890; Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 65, 72, 1896.

Pleistocene: Besserer's Wharf and Greens Creek, Ottawa River.

Potamogeton Robbinsii Oakes. Hovey's Mag., vol. vii, p. 180, 1841; Kn., Am. Geol., vol. xviii, p. 371, 1896.

Glacial: Morgantown, West Virginia.

Potamogeton? verticillatus Lx. Cret. and Tert. Fl., p. 142, pl. xxiii, f. 5, 6, 1883.

Green River group: Florissant, Colorado.

POTENTILLA Linnæus. Syst., ed. i, 1735.

Potentilla anserina L. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 330, 1890; Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 66, 73, 1896.

Potentilla norvegica L. Dn., Can. Nat., vol. ii, p. 422, 1857.
Potentilla canadensis L. Dn., loc. cit., new ser., vol. iii, p. 71, 1868.
Potentilla simplex? Michx. Dn., Geol. Hist. Pl., p. 228, 1888.

Pleistocene: Greens Creek and Besserer's Wharf, Ottawa River, Canada.

Potentilla canadensis L.=Potentilla anserina.
Potentilla norvegica L.=Potentilla anserina.
Potentilla simplex? Mx.=Potentilla anserina.

PREISSITES Knowlton. Bull. Torr. Bot. Club, vol. xxi, p. 458, 1894.

Preissites Wardii Kn. Bull. Torr. Bot. Club, vol. xxi, no. 10, p. 458, pl. ccxix, 1894.
Fort Union group: Burns's Ranch, 30 miles below Glendive, Montana.

Prinos integrifolia Ell. Lx.= Ilex integrifolia.

PROTEÆPHYLLUM Fontaine. Potomac Fl., p. 281, 1889.

Proteæphyllum dentatum Font. Potomac Fl., p. 286, pl. clvi, f. 7; clxxii, f. 1, 4; clxxiii, f. 12, 14, 1889.
Potomac formation: Baltimore, Maryland.

Proteæphyllum ellipticum Font. Potomac Fl., p. 285, pl. cxlii, f. 1, 2, 1889.
Potomac formation: Fredericksburg, Virginia.

Proteæphyllum oblongifolium Font. Potomac Fl., p. 284, pl. cxxxix, f. 5; cxl, f. 1, 2, 1889.
Potomac formation: Fredericksburg, Virginia.

Proteæphyllum orbiculare Font. Potomac Fl., p. 283, pl. cxxxix, f. 4, 1889.
Potomac formation: Fredericksburg, Virginia.

Proteæphyllum ovatum Font. Potomac Fl., p. 285, pl. cxli, f. 1. 1889.
Potomac formation: Fredericksburg, Virginia.

Proteæphyllum reniforme Font. Potomac Fl., p. 282, pl. cxxxix, f. 3; clvi, f. 4; clx, f. 1, 2, 1889.
Potomac formation: Fredericksburg, near Dutch Gap Canal, Virginia.

Proteæphyllum tenuinerve Font. Potomac Fl., p. 286, pl. cl, f. 13; clvi, f. 2, 1889.
Potomac formation: Near Dutch Gap Canal, near Potomac Run, Virginia.

Proteæphyllum sp., Font. Potomac Fl., p. 284, pl. cxxxix, f. 2, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

PROTEOIDES Heer. Phyll. Crét. d. Nebr., p. 17, 1866.

Proteoides acuta Heer. Phyll. Crét. d. Nebr., p. 17. pl. iv, f. 7, 8, 1866; Lx., Trans Am. Phil. Soc., vol. xiii, p. 431, pl. xxiii, f. 5–7, 1869.
Dakota group: Kansas and Nebraska.

Proteoides daphnogenoides Heer. Phyll. Crét. d. Nebr., p. 17, pl. iv, f. 9, 10, 1866; Newby., Fl. Amboy Clays, p. 72, pl. xvii, f. 8, 9; xxxii, f. 11, 13, 14; xxxiii, f. 3; xli, f. 15, 1895 [1896].
Dakota group: Decatur, Nebraska.
Amboy clay: New Jersey; Staten Island; Sea Cliff, Long Island.
Mill Creek series: Mill Creek.

Proteoides grevilleæformis Heer. Phyll. Crét. d. Nebr., p. 17, pl. iv, f. 11, 1866; Lx., Trans. Am. Phil. Soc., vol. xiii, p. 432, pl. xxiii, f. 8, 1869.
Dakota group: Decatur, Nebraska; Kansas.

Proteoides lancifolius Heer. Neue Denkschr. Schweiz. Gesel., vol. xxiv, p. 12, pl. iii, f. 5, 6, 1871; Lx., Cret. and Tert. Fl., p. 50, 1883; Fl. Dak. Gr., p. 90, pl. xv, f. 5; l, f. 8, 1892.
Dakota group: Fort Harker, Kansas.

Proteoides longus Heer = Myrica longa.

Proteoides major Dn., Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 61, pl. xii, f. 54, 1893 [1894].
Upper Cretaceous: Wellington mine, Vancouver Island.

Proteoides Neillii Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 61, pl. xii, f. 53, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island.

Proteoides sp., Lx. Rept. on Clays in N. J., p. 29, 1878.
Amboy clay: Sayreville, New Jersey.

Proteoides sp., Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 61, pl. xiii, f. 55, 1893 [1894].
Upper Cretaceous: Wellington mine, Vancouver Island.

PROTOFICUS Saporta. Fl. Foss. Travert. d. Sézanne: Mem. Soc. Geol. d. Fr., 2d ser., vol. vii, p. 67, 1868.

Protoficus inequalis Newby. Proc. U. S. Nat. Mus., vol. v, p. 512, 1882 [1883].
Tertiary: Tongue River, Wyoming.

Protoficus Zeilleri Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 50, 1888.
Denver group: Golden, Colorado.

PROTOPHYLLUM Lesquereux. Cret. Fl., p. 100, 1874.

Protophyllum boreale Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 23, pl. iv, f. 13, 1882 [1883].
———: Peace River, Northwest Territory.

Protophyllum crassum Lx. Fl. Dak. Gr., p. 193, pl. lxv, f. 4, 1892.
Dakota group: Kansas.

Protophyllum credneroides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 363, pl. iii, f. 1; pl. viii, f. 4, 1874 [1876]; Cret. and Tert. Fl., p. 90, pl. ii, f. 1–3, 1883; Fl. Dak. Gr., p. 194, pl. xxxvi, f. 11; pl. xliii, f. 4, 5, 1892.
Dakota group: Kansas; New Ulm, Minnesota.

Protophyllum crenatum Kn. in Lx. Fl. Dak. Gr., p. 190, pl. lxv, f. 7, 1892.
Dakota group: Kansas.

Protophyllum denticulatum Lx. Fl. Dak. Gr., p. 193, pl. xxxvi, f. 9, 1892.
Dakota group: Kansas.

Protophyllum dimorphum Lx. Fl. Dak. Gr., p. 190, pl. xli, f. 1, 1892.
Dakota group: Kansas.

Protophyllum Haydenii Lx. Cret. Fl., p. 106, pl. xvii, f. 3, 1874; Fl. Dak. Gr., p. 192, pl. xliii, f. 1; pl. xliv, f. 1, 2, 1892.

Pterospermites Haydenii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 302, 1871 [1872].

Dakota group: Kansas.

Protophyllum intergerrimum Lx. Fl. Dak. Gr., p. 192, pl. xliii, f. 3, 1892; Geol. and Nat. Hist. Surv. Minn., p. 21, pl. B, f. 10, 11, 1893.

Dakota group: Mankato, Minnesota.

Protophyllum Leconteanum Lx. Cret. Fl., p. 103, pl. xvii, f. 4; pl. xxvi, f. 1, 1874; Fl. Dak. Gr., p. 187, pl. xl, f. 1, 1892.

Credneria Leconteana Lx. Am. Journ. Sci., vol. xlvi, p. 98, 1868.

Dakota group: Brookville, Kansas; Peace River, Northwest Territory.

Protophyllum minus Lx. Cret. Fl., p. 104, pl. xix, f. 2; pl. xxvii, f. 1, 1874.

Dakota group: Kansas.

Protophyllum? Mudgii (Lx.).

Quercus Mudgii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 302, 1871 [1872].

Protophyllum Mugdii Lx. Cret. Fl., p. 106, pl. xviii, f. 3, 1874.

Dakota group: Kansas.

Protophyllum multinerve Lx. Cret. Fl., p. 105, pl. xviii, f. 1, 1874; Fl. Dak. Gr., p. 191, pl. xliii, f. 2; lxv, f. 1, 1892.

Pterospermites multinervis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 302, 1871 [1872].

Dakota group: Southern Kansas.

Protophyllum nanaimo Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 28, pl. viii, f. 35, 1882 [1883].

Upper Cretaceous: Nanaimo; Baynes Sound.

Protophyllum nebrascense Lx. Cret. Fl., p. 103, pl. xxvii, f. 3, 1874.

Dakota group; Decatur, Nebraska.

Protophyllum obovatum Newby. Fl. Amboy Clays, p. 128, pl. xxxviii, f. 4, 1895 [1896.]

Amboy clay: Woodbridge, New Jersey.

Protophyllum præstans Lx. Fl. Dak. Gr., p. 188, pl. xli, f. 2, 3; pl. xlii, f. 3, 4, 1892.

Dakota group: Kansas.

Protophyllum pseudospermoides Lx. Fl. Dak. Gr., p. 194, pl. lix, f. 2, 1892.

Dakota group: Kansas.

Protophyllum pterospermifolium Lx. Fl. Dak. Gr., p. 195, pl. lix, f. 1, 1892.

Dakota group: Kansas.

Protophyllum quadratum Lx. Cret. Fl., p. 104, pl. xix, f. 1, 1874.

Pterospermites quadratus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 301, 1871 [1872].

Dakota group: South of Fort Harker, Kansas.

Protophyllum querciforme Hollick. Bull. Torr. Bot. Club, vol. xxii, p. 227, pl. ccxxxvii, f. 1, 1895.
Dakota group: Fort Harker, Kansas.

Protophyllum rugosum Lx. Cret. Fl., p. 105, pl. xvii, f. 1, 2; pl. xix, f. 3, 1874.
Pterospermites rugosus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 426, 1872 [1873].
Dakota group: South of Fort Harker, Kansas; Coal Brook, Northwest Territory.

Protophyllum Sternbergii Lx. Cret. Fl., p. 101, pl. xvi; pl. xviii, f. 2, 1874; Fl. Dak. Gr., p. 189, pl. xlii, f. 1, 1892.
Pterospermites Sternbergii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 425, 1872 [1873].
Dakota group: Fort Harker, Kansas.

Protophyllum? trilobatum Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 397, 1875 [1876]. [Apparently not afterward recognized.
Dakota group: Kansas.

Protophyllum undulatum Lx. Fl. Dak. Gr., p. 189, pl. xlii, f. 2, 1892.
Dakota group: Kansas.

Protophyllum sp., Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 63, pl. xi, f. 46, 47, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver Island; Nanaimo.

PRUNUS (Tournefort.) Linnæus. Syst., ed. i, 1735.

Prunus? acutifolia Newby. Fl. Amboy Clays, p. 90, pl. xiv, f. 1, 1895 [1896.]
Amboy clay: Woodbridge, New Jersey.

Prunus (Amygdalus) antecedens Lx. Fl. Dak. Gr., p. 144, pl. lv, f. 4, 1892.
Dakota group: Kansas.

Prunus caroliniana (Mill.) Ait. Hort. Kew., ed. i, vol. ii, p. 163, 1789.
Prunus caroliniana Michx. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 363, 1859; Geol. Tenn., p. 427, pl. K, f. 6, 1869.
Pleistocene?: Somerville, Fayette County, Tennessee.

Prunus cretacea Lx. Am. Journ. Sci., vol. xlvi, p. 102, 1868.
Dakota group: Lancaster County, Nebraska.

Prunus dakotensis Lx. Cret. and Tert. Fl., p. 237, pl. xlviA, f. 8, 1883.
Fort Union group: Bad Lands, Dakota.

Prunus Parlatorii (Heer) Lx.=Andromeda Parlatorii.

Prunus variabilis Newby. Proc. U. S. Nat. Mus., vol. v, p. 509, 1882 [1883].
Eocene?: Cook Inlet, Alaska.

PSILOTITES Goldenberg. Fl. Saræpontana Foss., heft i, p. 13, 1855.

Psilotites inermis (Newby.) Schimp. Pal. Vég., vol. iii, p. 547, 1874.
Psilotum inerme Newby. Later Extinct Floras, p. 38, 1868.
Fort Union group: Fort Union.

Psilotum inerme Newby.=Psilotites inermis.

PTENOSTROBUS Lesquereux. Cret. Fl., p. 114, 1874.

Ptenostrobus nebrascensis Lx. Cret. Fl., p. 114, pl. xxiv, f. 1, 1874.
Dakota group: Winnebago Village, Missouri River.

PTERIS Linnæus. Gen. Pl, p. 322, 1737.

Pteris affinis Lx. = Osmunda affinis = Asplenium subsimplex.

Pteris anceps Lx. = Osmunda affinis = Asplenium subsimplex.

Pteris dakotensis Lx. Fl. Dak. Gr., p. 24, pl. i, f. 2, 3, 1892.
Dakota group: Kansas.

Pteris elegans Newby. Proc. U. S. Nat. Mus., vol. v, p. 503, 1882 [1883].
Miocene?: Currant Creek, Oregon.

Pteris erosa Lx. = Asplenium erosum.

Pteris (Oleandra) glossopteroides Dn. Trans. Roy. Soc. Canada, vol. i., sec. iv, p. 24, pl. iv, f. 16, 1882 [1883].
Upper Cretaceous: Protection Island.

Pteris Gardneri Lx. = Gymnogramma Gardneri.

Pteris pinnæformis Heer, Lx. = Pteris pseudopinnæformis.

Pteris pseudopinnæformis Lx. Tert. Fl., p. 52, pl. iv, f. 3, 4, 1878.
Pteris pinnæformis Heer. Lesquereux, Ann. Rept. U. S. Geol. and Geor. Surv. Terr., p. 384, 1870 [1771]; ibid, p. 283, 1871 [1872].
Denver group: Golden, Colorado.

Pteris Russellii Newby. Proc. U. S. Nat. Mus., vol. v, p. 503, 1882 [1883].
Laramie group: Vermejo Canyon, New Mexico.

Pteris Sitkensis Heer. Fl. Foss. Alask., p. 21, pl. i, f. 7*a*, 1869.
Eocene?: Near Sitka, Alaska; Mackenzie River.

Pteris subsimplex Lx. = Asplenium subsimplex.

Pteris undulata Lx. = Asplenium subsimplex.

PTEROCARYA Kunth. Ann. Sci. Nat., 1st ser., vol. ii, p. 345, 1824.

Pterocarya americana Lx. Ann. Rept. U. S. Geol. and Georg. Surv. Terr., p. 417, 1873 [1874]; Tert. Fl., p. 290, pl. lviii, f. 3, 1878.
Green River group: Middle Park, Colorado.

Pterocarya retusa Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 56, 1888.
Denver group: Golden, Colorado.

PTEROPHYLLUM Brongniart. Prodr. Hist. Veg. Foss., p. 95, 1828.

Pterophyllum? Haydenii Lx. = Podozamites Haydenii.

Pterophyllum californicum Font. in Diller and Stanton. Bull. Geol. Soc. Am., vol. v, p. 450, 1894. Nomen nudum.
Knoxville beds: Tehama County, California.

PTEROSPERMITES Heer. Fl. Tert. Helv., vol. iii, p. 36, 1859.

Pterospermites cordatus Ward. Bull. U. S. Geol. Surv., no. 37, p. 93, pl. xli, f. 4, 1889.
Fort Union group: Seven-Mile Creek, Montana.

Pterospermites cupanioides (Newby.) Kn. Proc. U. S. Nat. Mus., vol. xvi, p. 35, pl. ii, f. 1, 1893.
Phyllites cupanioides Newby. Later Extinct Floras, p. 74, 1868.
Pterospermites Whitei Ward. Bull. U. S. Geol. Surv., no. 37, p. 94, vol. xvi, f. 5, 6, 1887.
Fort Union group: Glendive? Montana.

Pterospermites dentatus Heer. Fl. Foss. Arct., vol. i, p. 138, pl. xxi, f. 15*b*; xxiii, f. 6, 7, 1868; Lesquereux, Proc. U. S. Nat. Mus., vol. x, p. 45, 1887.
Miocene?: Mackenzie River; Upper Kanab Valley, Utah.

Pterospermites grandidentatus Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 53, 1888.
Denver group: Golden, Colorado.

Pterospermites Haydenii Lx. = Protophyllum Haydenii.

Pterospermites longeacuminatus Lx. Fl. Dak. Gr., p. 186, pl. lix, f. 3, 1892.
Dakota group: Kansas.

Pterospermites modestus Lx. Fl. Dak. Gr., p. 186, pl. lviii, f. 5, 1892.
Dakota group: Kansas.

Pterospermites minor Ward. Bull. U. S. Geol. Surv., no. 37, p. 95, pl. xlii, f. 1-3, 1887.
Fort Union group: Burns's Ranch, Montana.

Pterospermites multinervis Lx. = Protophyllum multinerve.

Pterospermites quadratus Lx. = Protophyllum quadratum.

Pterospermites rugosus Lx. = Protophyllum rugosum.

Pterospermites spectabilis Heer. Fl. Foss. Arct., vol. ii, abt. iv, p. 480, pl. xliii, f. 15 *b*; liii, f. 1-4, 1869; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 27, 1888.
Miocene: Spanish Peak, California.

Pterospermites Sternbergii Lx. = Protophyllum Sternbergii.

Pterospermites Whitei Ward = Pterospermites cupanioides.

Pterospermites sp. Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 53, 1888.
Denver group: Golden, Colorado.

Pterospermites sp. Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

Pterospermites sp. Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.
Montana formation: Point of Rocks, Wyoming.

PYRUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Pyrus cretacea Newby. Later Extinct Floras, p. 12, 1868.
Dakota group: Kansas.

QUERCINIUM Unger in Endlicher. Gen. Pl., suppl. ii, p. 101.

Quercinium Knowltoni Felix. Zeitschr. d. Deutschen Geolog. Gesell. Jahr. 1896, p. 250, pl. vi, f. 2, 1896.
Miocene: Amethyst Mountain, Yellowstone National Park.

QUERCOPHYLLUM Fontaine. Potomac Fl., p. 307, 1889.

Quercophyllum grossedentatum Font. Potomac Fl., p. 307, pl. clvi, f. 9, 1889.

Potomac formation: Near Brooke, Virginia.

Quercophyllum tenuinerve Font. Potomac Fl., p. 308, pl. cxlix, f. 6, 7, 1889.

Potomac formation: Fredericksburg, Virginia.

QUERCUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Quercus acrodon Lx. = Quercus Lesquereuxiana.

Quercus æmulans Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 288, 1871 [1872].

Eocene?: Washakie Station, Wyoming.

Quercus alnoides Lx. Fl. Dak. Gr., p. 54, pl. vii, f. 3, 1892.

Dakota group: Kansas.

Quercus anceps Lx. = Diospyros ambigua.

Quercus angustiloba Al. Br. in Ludwig. Palæontogr., vol. viii, p. 103, pl. xxxvi, f. 3, 1861; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 378, 1872 [1873]; Tert. Fl., p. 161, pl. xxi, f. 4, 5, 1878.

Laramie group: Golden, Colorado.

Eolignitic?: Cross Lake, Louisiana?

Quercus antiqua Newby. Later Extinct Floras, p. 26, 1868.

Dakota group?: Banks of Rio Dolores, Utah.

Quercus aquamara (Ward) n. comb.

Hedera aquamara Ward. Bull. U. S. Geol. Surv., no. 37, p. 59, pl. xxvi, f. 7, 1887.

Laramie group: Black Buttes, Wyoming.

Quercus attenuata? Göpp. Lx. = Quercus viburnifolia.

Quercus banksiæfolia Newby. Bost. Journ. Nat. Hist., vol. vii, p. 522, 1863.

———: Bellingham Bay, Washington.

Quercus benzoin? Lx. = Persea Leconteana.

Quercus bicornis Ward. Bull. U. S. Geol Surv., no. 37, p. 24, pl. ix, f. 3, 1887.

Fort Union group: Seven-Mile Creek, Montana.

Quercus Boweniana Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 6, pl. ii, f. 5, 6, 1878.

Miocene: California.

Quercus Breweri Lx. = Quercus consimilis (f. 5–8) and Q. paucidentata (f. 9).

Quercus carbonensis Ward. Bull. U. S. Geol. Surv., no. 37, p. 25, pl. ix, f. 6, 1887.

Dryophyllum basidentatum Ward. Op. cit., p. 27, pl. xi, f. 2, 1887.

Laramie?: Carbon, Wyoming.

Quercus castaneopsis Lx. Cret. and Tert. Fl., p. 155, pl. xxviii, f. 10, 1883.

Green River group: Uinta County, formerly but incorrectly called Randolph County, Wyoming.

Quercus castanoides Newby. Proc. U. S. Nat. Mus., vol. v, p. 506, 1882 [1883].
Eocene: Green River, Wyoming.

Quercus castanopsis Newby. Proc. U. S. Nat. Mus., vol. v, p. 505, 1882 [1883].
Fort Union group: Yellowstone River.

Quercus celastrifolia Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 46, 1888.
Denver group: Golden, Colorado.

Quercus chamissonis Heer. Öfversigt k. Vetensk-Akad. Förhandlingar 1868, p. 64, 1868; Fl. Foss. Alask., p. 33, pl. vi, f. 7, 8, 1869.
Eocene?: Port Graham, Alaska.

Quercus chlorophylla Ung. = Quercus? chlorophylloides.

Quercus? chlorophylloides nom. nov.
Quercus chlorophylla Ung. Chlor. Prot., p. 111, pl. xxxi, f. 1, 18—; Lx., Am. Journ. Sci., vol. xlv, p. 206, 1868; Trans. Am. Phil. Soc., vol. xiii, p. 416, pl. xvii, f. 5–7, 1869; Tert. Fl., p. 151, pl. xxi, f. 3, 1878.
Eolignitic: Mississippi.
Denver group: [Locality not mentioned.]
Laramie group: Marshall and Erie, Colorado; Fishers Peak, New Mexico.

[NOTE.—After looking up the original of the European form, as well as many other figures, I am convinced that our leaf is not the same. Our leaf is ovate; the European are more nearly obovate. There is also some doubt as to our leaf belonging to Quercus. In absence of more definite information I have changed the name but retained it under Quercus.—F. H. K.]

Quercus chrysolepis Leib. forma **montana** Lx. Proc. U. S. Nat. Mus., vol. x, p. 38, 1887.
Miocene: Placer County, California.

Quercus cineroides Lx. Tert. Fl., p. 152, pl. xxi, f. 6, 1878.
———?: Location and formation unknown.

Quercus Cleburni Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 399, 1873 [1874]; Tert. Fl., p. 154, pl. xx, f. 2, 1878. [Of doubtful validity.]
Laramie group: Black Buttes, Wyoming.

Quercus coloradensis Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 46, 1888.
Denver group: Golden, Colorado.

Quercus competens Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 370, 1875 [1876]. [Apparently not afterwards referred to by author.]
Montana formation?: Point of Rocks, Wyoming.

Quercus consimilis Newby. Proc. U. S. Nat. Mus., vol. v, p. 505, 1882 [1883].
Quercus Breweri Lx. Cret. and Tert. Fl., p. 246, pl. liv, f. 5–8 [not f. 9], 1883.
Miocene: Bridge Creek and John Day Valley, Oregon.

Quercus convexa Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 4, pl. i, f. 13–17, 1878; Cret. and Tert. Fl., p. 265, pl. xlvB, f. 5, 6, 1883.
Miocene: Table Mountain, California.

Quercus coriacea Newby. Bost. Journ. Nat. Hist., vol. vii, p. 521, 1863.

———: Bellingham Bay, Washington.

Quercus? crassinervi(s)a? Göpp. Zeitschr. Deutsch. Geol. Ges., vol. iv, p. 491, 1852; Lesquereux, Am. Journ. Sci., vol. xxvii, p. 364, 1859; Geol. Tenn., p. 427, pl. K, f. 1, 1869.

Pleistocene?: Somerville, Fayette County, Tennessee.

Qurcus Crossii Lx. Proc. U. S. Nat. Mus., vol. x, p. 39, pl. ii, f. 5, 6, 1887.

Denver group: Silver Cliff, Colorado.

Quercus cuneata Newby. Later Extinct Floras, p. 25, 1868.

Dakota group: Blackbird Hill, Nebraska.

Quercus dakotensis Lx. Cret. and Tert. Fl., p. 39, 1883; Fl. Dak. Gr., p. 56, pl. vii, f. 4, 1892.

Dakota group: Kansas.

Quercus Dallii Lx. Proc. U. S. Nat. Mus., vol. v, p. 446, pl. viii, f. 2–5, 1882 [1883].

Eocene?: Cook Inlet, Alaska.

Eocene?: North Fork Similkameen River, British Columbia.

Quercus Dawsoni nom. nov.

Quercus platania Heer. Dawson, Trans. Roy. Soc. Canada, vol. vii, sec. iv, p. 72, pl. xi, 1889. [Not Q. platania Heer.]

Fort Union group: Near Calgary, and Bow River, Canada.

Quercus Dentoni Lx. Cret. and Tert. Fl., p. 224, pl. xlviii, f. 1, 11, 1883.

Fort Union group: Bad Lands, Dakota.

Montana formation?: Point of Rocks, Wyoming?

Quercus distincta Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 6, pl. ii, f. 7–9, 1878.

Quercus voyana Lx. Op. cit., p. 8, pl. ii, f. 12, 1878.

Miocene: Chalk Bluffs, California.

Quercus doljensis Pilar. Fl. Foss. Susedana, p. 37, pl. vii, f. 14, 1883, Ward, Bull. U. S. Geol. Surv., no. 37, p. 25, pl. ix, f. 4, 5, 1887.

Rhus pseudo-Meriani Lx. Tert. Fl., p. 293, pl. lviii, f. 11, 1878.

Laramie group: Black Buttes and Hodges Pass, Wyoming.

Quercus drymeja Ung. Chlor. Prot., p. 113, pl. xxxii, f. 1–4, 1847; Lx., Tert. Fl., p. 157, pl. xix, f. 14, 1878; Cret. and Tert. Fl., p. 154, pl. xxviii, f. 12 [not p. 245, pl. liv, f. 4], 1883.

Green River group: Florissant, Colorado.

Miocene: Bridge Creek, Oregon.

Quercus drymeja Ung. var.? Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 292, 1871 [1872].

Laramie group? Evanston, Wyoming.

Quercus dubia Newby. Proc. U. S. Nat. Mus., vol. v, p. 506, 1882, [1883].

Tertiary: Tongue River, Wyoming.

Quercus elæna Ung. Chlor. Prot., p. 112, pl. xxxii, f. 4, 1847; Lesquereux, Cret. and Tert. Fl., p. 155, pl. xxviii, f. 11, 13, 1883.

———: Florissant, Colorado.

Quercus elænoides Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 4, pl. i, f. 9–12, 1878.

Miocene: Table Mountain, California.

Green River group: Florissant, Colorado.

Quercus elkoana Lx.= Carpinus grandis.

Quercus elliptica Newby. Bost. Journ. Nat. Hist., vol. vii, p. 523, 1863.

———: Bellingham Bay, Washington.

Quercus ellisiana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 297, 1871 [1872]; Tert. Fl., p. 155, pl. xx, f. 4, 5, 6, 7, 8, 1878.

Quercus Pealei Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 297, 1871 [1872]; Kn., Bull. U. S. Geol. Surv., no. 105, p. 53, 1893.

Livingston beds: Hodson coal mine, near Bozeman, Montana.

Laramie group: Head of Fir Canyon, near Bozeman, Montana.

Quercus? ellsworthianus Lx. Cret. Fl., p. 65, pl. vi, f. 7, 1878.

Quercus ellsworthianus Lx. Am. Jour. Sci., vol. xlvi, p. 96, 1868.

Laurophyllum ellsworthianum Lx. Fl. Dak. Gr., p. 95, pl. xiii, f. 7, 1892.

Dakota group: Kansas and Nebraska.

Quercus Evansii Lx. Am. Journ. Sci., vol. xxvii, p. 360, 1859.

———: Bellingham Bay, Washington.

Quercus falcata Michx. Knowlton, Am. Geol., vol. xviii, p. 371, 1896.

Glacial: Morgantown, West Virginia.

Quercus flexuosa Newby. Bost. Journ. Nat. Hist., vol. vii, p. 521, 1863.

Cretaceous: Bellingham Bay, Washington.

Quercus? fraxinifolia Lx. Tert. Fl., p. 154, pl. xx, f. 3, 1878.

Quercus Laharpi Gaud. Nouv. Mém. Soc. Helv. Sci. Nat., vol. xvii, p. 45, pl. iii, f. 5, 10, 1860; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 297, 1871 [1872].

Livingston beds: Bozeman coal field, Montana.

Eocene?: ?Cherry Creek, Oregon.

Quercus furcinervis Rossm. Lx. = Quercus furcinervis americana [pl. liv, f. 1, 2] and Quercus paucidentata [pl. liii, f. 8–14].

Quercus furcinervis americana var. nov.

Phyllites furcinervis Rossm. Verst. Braunk. von Altsatlle in Böhmen, p. 33, pl. vii, f. 26–31, 1840.

Quercus furcinervis (Rossm.) Ung. Syn. v, Fl. Foss., p. 217, 1845; Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 398, 1873 [1874]; Cret. and Tert. Fl., p. 244, pl. liv, f. 1, 2, 1883.

Miocene: Bridge Creek, Oregon; Plumas County, California; Cherry Creek, Oregon; Selma, Texas.

Quercus Furuhjelmi Heer. Öfversigt k. Vetensk.-Akad. Förhandlgar., 1868, p. 64, 1868; Fl. Foss. Alask., p. 32, pl. v, f. 10; pl. vi, f. 1, 2, 1869.

Eocene?: Port Graham, Alaska.

Quercus Gaudini Lx. Am. Journ. Sci., vol. xxvii, p. 360, 1859; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 296, 1871 [1872]; Proc. U. S. Nat. Mus., vol. x, p. 39, pl. ii, f. 7, 8, 1887.

——— ?: Warm Soring Canyon; Bellingham Bay; Upper Kanab Valley, Utah.

Quercus glascoena Lx. Fl. Dak. Gr., p. 55, pl. vi, f. 6, 1892.

Dakota group: Kansas.

Quercus Godeti? Heer. Fl. Tert. Helv., vol. ii, p. 50, pl. lxxviii, f. 10, 11, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 297. 1871 [1872]; Tert. Fl., p. 153, pl. xx, f. 1, 1878.

Livingston beds: Bozeman coal field, Montana.

Quercus Gœpperti Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 7, pl. ii, f. 11, 1878.

Miocene: Chalk Bluffs, California.

Quercus goldianus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 398, 1873 [1874]. [Not recognized by its author after first description.]

Denver group?: Golden, Colorado.

Quercus gracilis Newby. = Dryophyllum subfalcatum.

Quercus Haidingeri Ett. Foss. Fl. v. Wien., p. 12, pl. ii, f. 1, 1851; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 387, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 313, 1874 [1876]; Tert. Fl., p. 156, pl. xx, f. 9, 10, 1878.

Denver group?: Golden, Colorado.

———: ? Locality of American types unknown.

Quercus Haydeni Lx. Am. Journ. Sci., vol. xlv, 2d ser., p. 205, 1869.

Quercus Haydenii Lx. Tert. Fl., p. 157, pl. xix, f. 10, 1878.

Laramie: Rock Creek, Laramie Plains, Wyoming.

Quercus hexagona Lx. Am. Journ. Sci., vol. xlvi, p. 95, 1868; Cret. Fl., p. 64, pl. v, f. 8, 1874; Fl. Dak. Gr., p. 56, pl. vii, f. 5, 1892.

Dakota group: Cass County, Nebraska; Delphos, Kansas.

Quercus (Dryophyllum) hieracifolia (Deb.) Hos. and v. d. Marck, Fl. d. Westf. Cret. Form., p. 166, pl. 31, f. 85–88, 1880; Lx., Fl. Dak. Gr., p. 58, pl. iii, f. 15, 1892.

Dakota group: Kansas.

Quercus Holmesii Lx. Fl. Dak. Gr., p. 58, 1892.

Dryophyllum (Quercus) salicifolium* Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p 340, pl. viii, f. 2, 1874 [1876]. [*Name preoccupied by Q. salicifolia Newby., q. v.]

Dryophyllum (Quercus) Holmesii Lx. Cret. and Tert. Fl., p. 38, pl. iv, f. 8, 1883.

Upper Cretaceous: Port McNeill, Vancouver.

Dakota group?: San Juan River, Southwestern Colorado.

Quercus horniana Lx. Proc. U. S. Nat. Mus., vol. xi, p. 17, pl. v, f. 6, 1888.

Miocene: John Day Valley, Oregon.

Quercus (Dryophyllum) Hosiana Lx. Fl. Dak. Gr., p. 57, pl. iii, f. 14, 1892.

Dakota group: Kansas.

Quercus idahoensis Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 729, pl. cii, f. 4, 1898.

Payette formation: Marsh, Idaho.

Quercus ilicoides? Heer. Lesquereux.=Ilix dissimilis.

Quercus imbricaria Michx., **fossilis** Lx., Proc. U. S. Nat. Mus., vol. x, p. 39, 1887.

Pleistocene?: Bridgeton, New Jersey.

Quercus Johnstrupi Heer? Fl. Foss. Arct., vol. vii, p. 24, pl. lvi, f. 7-12*a*, 1883; Newby., Fl. Amboy Clays, p. 69, pl. xix, f. 7. 1895[1896].

Amboy clay: Sayreville, New Jersey.

Quercus kanseana (Lx.) n. comb.

Hamamelites kansaseana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 355, pl. vii, f. 4, 1874 [1876].

Hamamelites kansaseanus Lx. Cret. and Tert. Fl., p. 70, pl. iv, f. 5, 1883.

Alnus kanseana Lx. Cret. Fl., p. 62, pl. xxx, f. 8, 1878.

Dakota group: Kansas.

Quercus (Dryophyllum) latifolia Lx. Fl. Dak. Gr., p. 58, 1892.

Dryophillum (Quercus) latifolium Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 393, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 340, pl. vi., f. 1, 1874 [1876]; Cret. and Tert. Fl., p. 37, pl. iv, f. 1, 2, 1883.

Dakota group: Kansas.

Quercus Laharpi Gaud. Lx.=Quercus? fra[illegible]ifolia.

Quercus laurifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 505, 1882 [1883].

Fort Union group: Fort Berthold, North Dakota.

Quercus Lesquereuxiana nom. nov.

Quercus acrodon* Lx. Am. Journ. Sci., vol. xlv, 2d ser, p. 205, 1869; Tert. Fl., p. 158, pl. xix, f. 11-13, 1878.

[*Q. acrodon Lx., 1868 antedated by Q. acrodon Massal., 1853.]

Laramie group?: Rock Creek, Laramie Plains, Wyoming.

Quercus lonchitis Ung. Gen. et Sp. Pl. Foss., p. 403, 1850; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 6, 1871 [1872]; Proc. U. S. Nat. Mus., vol. xi, p. 22, 1888.

Eocene?: Green River, Wyoming.

Miocene: Cherry Creek, Oregon.

Quercus Lyellii Heer. Phil. Trans., vol. clii, pt. 2, p. 1058, pl. lxiii, f. 2-9; lxiv, f. 1-4; lxv, f. 12*b*; lxvi, f. 1, 2; lxviii, f. 4, 5, 1862; Lx., Am. Journ. Sci., vol. xlv, p. 206, 1868; Trans. Am. Phil. Soc., vol. xiii, p. 415, pl. xvii, f. 1-3, 1869.

Eolignitic: Mississippi.

Quercus mediterranea Ung. Chlor. Prot., p. 114, pl. xxxii f. 5-9, 1847; Lx., Cret. and Tert. Fl., p. 153, pl. xxviii, f. 9, 1883.

Green River group: Florissant, Colorado.

Quercus minor (Marsh.) Sargent.

Quercus obtusiloba Michx. Penhallow in Coleman, Journ. Geol., vol. iii, p. 635, 1895.

Pleistocene: Don River, Canada.

Quercus Moorii Lx. Trans. Am. Phil. Soc., vol. xiii, p. 415, pl. xvi, f. 1-3, 1869.
Eolignitic: Mississippi.
Eocene: Lassen County, California.

Quercus morrisoniana Lx. Cret. and Tert. Fl., p. 40, pl. xvii, f. 1, 2, 1883; Hollick, Trans. N. Y. Acad. Sci., vol. xvi, p. 131, pl. xiii, f. 11, 12, 1897.
Dakota group: Morrison, Colorado.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Quercus Mudgii Lx. = Protophyllum Mudgii.

Quercus multinervis Lx. Am. Journ. Sci., vol. xxvii, p. 360, 1859.
———: Nanaimo, Vancouver Island.

Quercus mystifolia Willd. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 363, 1859; Geol. Tenn., p. 427, pl. K, f. 3, 1869.
Pleistocene?: Somerville, Fayette County, Tennessee.

Quercus negundoides Lx. Ann. Rept. U. S. Geol. and Geog. Surv. Terr., p. 292, 1871 [1872]; Tert. Fl., p. 161, pl. xxi, f. 2, 1878.
Laramie group: Evanston, Wyoming.

Quercus neriifolia Al. Br. Unger, Gen. et Sp. Pl. Foss., p. 403, 1850; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 413, 1873 [1874]; Tert. Fl., p. 150, pl. xix, f. 4, 5, 1878. [Identification very doubtful.]
Laramie group: Raton Mountains, New Mexico.
———?: Pikes Peak, Colorado.

Quercus nevadensis Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 5, pl. ii, f. 3, 4, 1878.
Quercus Olafseni Heer. Lesquereux, Cret. and Tert. Fl., p. 245, pl. liv, f. 3, 1883.
Miocene: Chalk Bluffs, California.

Quercus ? Novæ-Cæsareæ Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 131, pl. xiii, f. 9, 10, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Quercus obtusiloba Mx. = Quercus minor.

Quercus ? (Dryophyllum) occidentalis (Dn.) n. comb.
Dryophyllum occidentale Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 58, pl. vii, f. 17, 18, 1893 [1894].
Dryophyllum neillianum Dn. Op. cit., p. 58, pl. vii, f. 19, 1893 [1894].
Dryophyllum elongatum Dn. Op. cit., p. 58, pl. vii, f. 20, 1893 [1894].
Dryophyllum sp., Dn. Op. cit., p. 58, pl. xii, f. 59, 1893 [1894].
Upper Cretaceous: Port McNeill, Vancouver.

Quercus Olafseni Heer. Fl. Foss. Arct., vol. i, p. 109, pl. x, f. 5; pl. xi, f. 7; pl. xlvi, f. 10; p. 138, pl. xxii, f. 17, 1868; Lx., Cret. and Tert. Fl., p. 224, pl. xlviii, f. 4, 1883.
Eocene?: Cherry Creek, Oregon; Lassen County, California.
Miocene?: Table Mountain, California; Mackenzie River.
Fort Union group: Bad Lands, Dakota.

Quercus Olafseni Heer. Lx. [Cret. and Tert. Fl., p. 245, pl. liv, f. 3] = Quercus nevadensis.

Quercus Osbornii Lx. Cret. and Tert. Fl., p. 154, pl. xxxviii, f. 17, 1883.

Green River group: Florissant, Colorado.

Quercus pandurata Heer. Öfversigt k. Vetensk.-Akad. Förhandlingar. 1868, p. 64, 1868; Fl. Foss. Alask., p. 33, pl. vi, f. 6, 1869.

Eocene?: Port Graham, Alaska.

Quercus paucidentata Newby. Proc. U. S. Nat. Mus., vol. v, p. 505, 1882 [1883].

Quercus furcinervis Rossm. Lesquereux, Cret. and Tert. Fl., p. 244, pl. liii, f. 8–14 [not pl. liv, f. 1–2], 1883.

Quercus Breweri Lx. Cret. and Tert. Fl., p. 246, pl. liv, f. 9 [not f. 5–8], 1883.

———: Bridge Creek and John Day Valley, Oregon.

Quercus payettensis Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 730, pl. cii, f. 9, 1898.

Payette formation: Jackass Creek, Boise County, Idaho.

Quercus Pealei Lx.=Quercus ellisiana.

Quercus platania Heer Dawson=Quercus Dawsoni.

Quercus platania Heer Lx.=Platanus cordata.

Quercus platania var. rotundifolia Lx.=Dombeyopsis platanoides.

Quercus platinervis Lx. Am. Journ. Sci., vol. xxvii, p. 361, 1859.

———: Nanaimo, Vancouver Island.

Quercus poranoides Lx. Cret. Fl., p. 66, pl. xxx, f. 9, 1874.

Dakota group: Kansas.

Quercus pseudo-alnus Ett. Abhandl. d. k. k. geol. Reichsanstalt, vol. i, abt. iii, p. 5, pl. i, f. 7, 1852; Lx., Cret. and Tert. Fl., p. 244, pl. liii, f. 1–7, 1883.

Miocene: John Day Valley, Oregon.

Quercus pseudo-castanea Göpp. in Dunker et Meyer. Palæontogr, ii, pl. xxxv, f. 1, 1853; Heer, Öfversigt k. Vetensk.-Akad. Förhandlingar. 1868, p. 64, 1868; Fl. Foss. Alask., p. 32, pl. vi, f. 3–5, 1869.

Eocene?: Port Graham, Alaska.

Quercus pseudo-chrysophylla Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 60, Appen., 1878.

Miocene: Oregon Creek, 20 miles north of Chalk Bluffs, California.

Quercus pseudo-lyrata Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 8, pl. ii, f. 1, 2, 1878; Proc. U. S. Nat. Mus., vol. xi, p. 17, pl. x, f. 1, 1888.

Miocene?: California.?

Miocene: John Day Valley, Oregon.

Quercus pseudo-lyrata acutiloba Lx. Proc. U. S. Nat. Mus., vol. xi, p. 17, pl. xi, f. 1, 1888.

Miocene: John Day Valley, Oregon.

Quercus pseudo-lyrata angustiloba Lx. Proc. U. S. Nat. Mus., vol. xi, p. 17, pl. xi, f. 2, 1888.

Miocene: John Day Valley, Oregon.

Quercus pseudo-lyrata brevifolia Lx. Proc. U. S. Nat. Mus., vol. xi, p. 18, pl. x, f. 2, 1888.
Miocene: John Day Valley, Oregon.

Quercus pseudo-lyrata latifolia Lx. Proc. U. S. Nat. Mus., vol. xi, p. 18, pl. xii, f. 1, 1888.
Miocene: John Day Valley, Oregon.

Quercus pseudo-lyrata obtusiloba Lx. Proc. U. S. Nat. Mus., vol. xi, p. 18, pl. x, f. 3, 1888.
Miocene: John Day Valley, Oregon.

Quercus pyrifolia Lx. Cret. and Tert. Fl., p. 154, pl. xxviii, f. 14, 1883.
Green River group: Florissant, Colorado.

Quercus retracta Lx. Trans. Am. Phil. Soc., vol. xii, p. 416, pl. xvi, f. 4, 5, 1869.
Eolignitic: Mississippi.

Quercus (Dryophyllum) rhamnoides Lx. Fl. Dak. Gr., p. 57, pl. xlviii, f. 4, 1892.
Dakota group: Kansas.

Quercus Saffordi Lx. Am. Journ. Sci., vol. xxvii, p. 364, 1859; 2d Rept. of Geol. Recon. of Ark., p. 319, pl. vi, f. 3, 1860; Geol. Tenn., p. 427, pl. K, f. 2*a*, 2*b*, 2*c*, 1869; Proc. U. S. Nat. Mus., vol. xi, p. 13, pl. v, f. 1-3, 1888.
Pleistocene?: Somerville, Fayette County, Tennessee.

Quercus salicifolia Newby. Later Extinct Floras. p. 24, 1868.
Dakota group: Blackbird Hill, Nebraska.

Quercus semialatus Lx. ≐ Anisophyllum semialatum.

Quercus semi-elliptica Göpp. Lx. = Planera longifolia.

Quercus serra Ung. Chlor. Prot., p. 109, pl. xxx, f. 5-7, 1847; Lx., Cret. and Tert. Fl., p. 153, 1883.
Green River group: Florissant, Colorado.

Quercus simplex Newby. Proc. U. S. Nat. Mus., vol. v, p. 505, 1882 [1883].
Miocene?: Bridge Creek, Oregon.

Quercus simulata Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 728, pl. ci, f. 3, 4; cii, f. 1, 2, 1898.
Payette formation: Marsh, Idaho.

Quercus sinuata Newby. Later Extinct Floras, p. 27, 1868.
Dakota group: Banks of Rio Dolores, Utah.

Quercus spurio-ilex Kn. in Lx. Fl. Dak. Gr., p. 53, pl. xlviii, f. 3, 1892.
Dakota group: Kansas.

Quercus Steenstrupiana ? Heer. Fl. Foss. Arct., vol. i, p. 109. pl. xi, f. 5; xlvi, f. 8, 9, 1868.
Miocene: Oregon Creek, 20 miles north of Chalk Bluffs, California.

Quercus stramineus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 378, 1872 [1873]; Tert. Fl., p. 151, pl. xix, f. 6, 7, 1878.
Laramie group: Golden, Colorado.

Quercus Sullyi Newby. Proc. U. S. Nat. Mus., vol. v, p. 506, 1882 [1883].
Fort Union group: Fort Berthold, North Dakota.

Quercus suspecta Lx. Fl. Dak. Gr., p. 52, pl. xlvii, f. 7; pl. xlviii, f. 1, 2, 1892.
Dakota group: Kansas.

Quercus transgressus Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 59, Appen., 1878.
Miocene: Oregon Creek, 20 miles north of Chalk Bluffs, California.

Quercus triangularis Göpp. Lx. = Quercus viburnifolia.

Quercus valdensis Heer. Fl. Tert. Helv., vol. ii, p. 49, pl. lxxviii, f. 15, 1856; Lx., Tert. Fl., p. 153, pl. xix, f. 8, 1878.
Denver group?: Rock Creek, Laramie Plains, Wyoming.

Quercus viburnifolia Lx. Tert. Fl., p. 159, pl. xx, f. 11, 12, 1878.
Quercus triangularis Göpp. [Ex. p.]. In Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 377, 1872 [1873].
Quercus attenuata? Göpp. In Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 398, 1873 [1874].
Denver group: Golden, Colorado.
Laramie group: Sand Creek, Colorado; Black Buttes, Wyoming.

Quercus victoriæ Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 27, pl. vii, f. 27, 1882 [1883].
Upper Cretaceous: Newcastle Island, Nanaimo, Protection Island, Port McNeill, Vancouver Island.

Quercus virens Mx. = Quercus virginiana.

Quercus virginiana Miller. Dict., ed. viii, no. 16, 1768.
Quercus virens Michx. Lesquereux, Am. Journ. Sci., vol. xxvii, p. 364, 1859.
Pleistocene: Banks of Mississippi, near Columbus, Kentucky.

Quercus Voyana Lx. = Quercus distincta.

Quercus Wardiana Lx. Fl. Dak. Gr., p. 53, pl. vii. f. 1, 1892.
Dakota group: Kansas.

Quercus Whitei Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 46, 1888.
Denver group: Golden, Colorado.

Quercus wyomingiana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 400, 1872 [1873]. [Not regarded by its author after first mention.]
Laramie: Black Buttes, Wyoming.

Quercus cf. cuspidata (Rossm.) Ung. Syn. Fl. Foss., p. 217, 1845. Lesquereux, Proc. U. S. Nat. Mus., vol. xi, p. 12, 1888.
Phyllites cuspidatus Rossm. Verst. Braunk. von Altsattle in Böhmen., p. 36, pl. ix, f. 38, 39, 1840.
Eolignitic: Boaz, Graves County, Kentucky.

Quercus sp., Lx. Rept. on Clays in N. J., p. 29, 1878.
Amboy clay: South Amboy, New Jersey.

Quercus sp., Dn. Geol. Surv. Canada, Rept. of Prog. for 1872–73. Appen. V, p. 68, 1873.
Upper Cretaceous: Hornby Island, British Columbia.
Cretaceous: Vancouver Island, British Columbia.

Quercus sp., Dn. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 27, 1886 [1887].
Upper Laramie group: Great Valley.

Quercus? sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 89, f. (in text) 28, 1890.
Eocene?: Similkameen Valley, British Columbia.

Quercus sp., Dn. Geol. Surv. Canada, Rept. Prog. for 1879–80. p. 54A, 1881.
Tertiary?: Roche Percée, Souris River.

Quercus sp., Hollick. Bull. Torr. Bot. Club, vol. xix, p. 332, 1892.
Miocene?: Bridgeton, New Jersey.

Quercus? sp., Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 131, pl. xiv, f. 9, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Quercus sp., Kn. Bull. Geol. Soc. Am., vol. viii, 1897.
Laramie group: Lance Creek, Converse County, Wyoming.

Quercus? sp., Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 730, 1898.
Payette formation: Marsh, Idaho.

RHAMNACINIUM Felix. Zeitschr. d. Deutschen geol. Gesell., vol. xlvi, p. 89, 1894.

Rhamnacinium radiatum Felix. Zeitschr. d. Deutschen geol. Gesell. Jahr. 1896, p. 252, pl. vi, f. 3, 1896.
Miocene: Amethyst Mountain, Yellowstone National Park.

RHAMNITES Forbes. Quat. Journ. Geol. Soc. Lond., vol. vii, p. 103, 1851.

Rhamnites apiculatus Lx. Fl. Dak. Gr., p. 171, pl. xxxvii, f. 8–13, 1892.
Dakota group: Kansas.

Rhamnites concinnus Newby. Later Extinct Floras, p. 50, 1868.
Rhamnus concinnus (Newby) Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A., p. 330, 1875.
Fort Union group: Fort Union, North Dakota.
Canadian upper Laramie: Porcupine Creek.

Rhamnites minor Hollick in Newby. Fl. Amboy Clays, p. 106, pl. xlii, f. 36, 1895 [1896].
Amboy clay: New Jersey?

Rhamnus acuminatifolius Web. Palæontogr., vol. ii, p. 206, 1853; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 407, 1872 [1873]. [Not afterwards mentioned by Lesquereux.]
———?: Six miles above Spring Canyon, Montana; Golden, Colorado.

Rhamnus? acuta Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 98, pl. xli, f. 6; pl. xlv, f. 13c, 1882; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 58, pl. clxxvii, f. 6, 1894.
Cretaceous: Lloyds Neck, Long Island.

Rhamnus alaternoides Heer. Fl. Tert. Helv., vol. iii, p. 78, pl. cxxiii, f. 21-23, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 405, 1873 [1874]; Tert. Fl., p. 278, pl. lii, f. 11, 11*a*, 1878.
Denver group: Golden Colorado.

Rhamnus Cleburni Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 381, 1872 [1873]; Tert. Fl., p. 280, pl. liii, f. 1-3, 1878.
Denver group: Golden Colorado.
Laramie group?: Black Buttes, Wyoming?; Upper Kanab Valley, Utah?: Cross Lake, Louisiana?

Rhamnus Cleburni Lx., var. —— Lx. Proc. U. S. Nat. Mus., vol. xi, p. 20, 1888.
Eocene?: Cherry Creek, Oregon.

Rhamnus concinnus Newby. Dn. = Rhamnites concinnus.

Rhamnus crenatus Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 55, 1888.
Denver group: Golden, Colorado.

Rhamnus Dechenii Web. Palæontogr., vol. ii, p. 204, pl. xxiii, f. 2, 1852; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 397, 1872 [1873]; Proc. U. S. Nat. Mus., vol. xi, p. 20, 1888.
Laramie group: Black Buttes, Wyoming; Golden, Colorado.
Eocene?: Cherry Creek, Oregon.

Rhamnus deformatus Lx. Cret. and Tert. Fl., p. 126, pl. xx, f. 6, 1883.
Denver group: Golden, Colorado.

Rhamnus deletus? Heer. Fl. Tert. Helv., vol. iii, p. 79, pl. cxxiii, f. 19-23, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 15, 1871 [1872]. [Not afterwards recognized by Lesquereux.]
Laramie group?: Raton Mountains, New Mexico.

Rhamnus elegans Newby. Later Extinct Floras, p. 49, 1868.
Fort Union group?: Belmont, Colorado.

Rhamnus? discolor Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 398, 1872 [1873]; Tert. Fl., p. 280, pl. lii, f. 17, 1878. [See Apeibopsis discolor.]
Laramie group: Sand Creek, Colorado?; Black Buttes, Wyoming.

Rhamnus Eridani Ung. Gen. et Sp. Pl. Foss., p. 465, 1850; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 25, 1888.
Eolignitic: Cross Lake, Louisiana.

Rhamnus Fischeri Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 15, 1871 [1872]. [Not afterwards referred to by its author.]
Laramie group?: Fischers Peak, New Mexico.

Rhamnus Gaudini Heer. Fl. Tert. Helv., vol. iii, p. 79, pl. cxxiv, f. 4-15; cxxv, f. 1, 7, 13, 1859; Newby., Bost. Journ. Nat. Hist., vol. vii, p. 520, 1863.
——: Birch Bay, Washington.

Rhamnus goldianus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 381, 1872 [1873]; Tert. Fl., p. 281, pl. liii, f. 4–8, 1878.

Berchemia multinervis Ward. Bull. U. S. Geol. Surv., no. 37, p. 73, pl. xxxiii, f. 2, 1887.

Denver group: Golden and Silver Cliff, Colorado, etc.

Rhamnus goldianus latior Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 381, 1872 [1873]. [Apparently not afterwards referred to by its author.]

———?: Golden, Colorado.

Rhamnus inæqualis Lx. = Diospyros brachycepala.

Rhamnus inæquilateralis Lx. Fl. Dak. Gr., p. 170, pl. xxxvii, f. 4–7, 1892.

Dakota group: Kansas.

Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Rhamnus intermedius Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 286, 1871 [1872]; Tert. Fl., p. 282, pl. liv, f. 3, 1878.

Green River group: Washakie Station, Wyoming.

Denver beds?: Golden, Colorado.

Laramie group: Raton Pass, New Mexico?

Rhamnus marginatus Lx. Geol. Rept. Ark., vol. ii, p. 319, pl. vi, f. 1, 1860; Trans. Am. Phil. Soc., vol. xiii, p. 420, pl. xxii, f. 3–5, 1869.

Eolignitic: Mississippi.

Rhamnus Meriani? Heer. Lesquereux, Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 405, 1873 [1874]. [Not afterwards recognized.]

Laramie group?: Black Buttes, Wyoming.

Rhamnus Mudgei Lx. Fl. Dak. Gr., p. 169, pl. xxxvii, f. 2, 3, 1892.

Dakota group: Kansas.

Rhamnus notatus? Sap. Ann. d. Sci. Nat., 5th ser. bot., vol. viii, p. 108, pl. xi, f. 8, 1867; Lx., Cret and Tert. Fl., p. 189, pl. xxxviii, f. 15, 1883.

Green River group: Florissant, Colorado.

Rhamnus obovatus Lx. Am. Journ. Sci., vol. xlv, 2d ser., p. 207, 1868; Tert. Fl., p. 281, pl. liv, f. 1, 2, 1878.

Laramie group?: Purgatory Canyon, New Mexico; Golden, Colorado?; Evanston, Wyoming?

Eocene?: Cherry Creek, Oregon.

Rhamnus oleæfolius Lx. Cret. and Tert. Fl., p. 189, pl. xxxviii, f. 14, 1883.

Green River group: Florissant, Colorado.

Rhamnus parvifolius Newby. Proc. U. S. Nat. Mus., vol. v, p. 511, 1882 [1883].

Fort Union group: Valley of the Yellowstone, Montana.

Rhamnus prunifolius Lx. Cret. and Tert. Fl., p. 85, 1883; Fl. Dak. Gr., p. 169, pl. xxxv, f. 14, 1892.

Dakota group: Kansas.

Rhamnus rectinervis Heer. Fl. Tert. Helv., vol. iii, p. 80, pl. cxxv, f. 2–6, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 295, 1871 [1872]; Tert. Fl., p. 279, pl. lii, f. 12–15, 1878.
Laramie group: Golden, Colorado; Black Buttes, Wyoming.
Laramie group?: Evanston, Wyoming; Bozeman coal field, Montana?

Rhamnus revoluta Lx. Fl. Dak. Gr., p. 171, pl. lxv, f. 5, 1892.
Dakota group: Kansas.

Rhamnus Rossmaessleri Ung. Gen. et Sp. Pl. Foss., p. 464, 1850; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 35, pl. iii, f. 5, 1892.
Cretaceous: Tottenville, Staten Island, New York.

Rhamnus Rossmässleri Ung. Lx.=Juglans rhamnoides.

Rhamnus similis Lx. Fl. Dak. Gr., p. 168, pl. xxxv, f. 12, 13, 1892.
Dakota group: Kansas.

Rhamnus salicifolius Lx. Am. Journ. Sci., vol. xlv, 2d ser., p. 206, 1868; Tert. Fl., p. 282, pl. liii, f. 9, 10, 1878.
Laramie group: Marshalls and Coal Creek, Colorado; Black Buttes, Wyoming.

Rhamnus tenax Lx. Am. Journ. Sci., vol. xlvi, p. 101, 1868; Cret. Fl., p. 109, pl. xxi, f. 4, 1874; Fl. Dak. Gr., p. 170, pl. xxxviii, f. 6, 1892.
Dakota group: Southern Kansas.

Rhamnus sp., Dn. Rept. Geol. and Res. near 49th Parallel, Appen. A, p. 330, 1875.
Lignite tertiary: Great Valley.

Rhizocaulon gracile Lx.=Phyllites improbatus.

RHUS (Tournefort.) Linnæus. Gen., ed. i, p. 84, 1737.

Rhus acuminata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 8, 1871 [1872]; Cret. and Tert. Fl., p. 194, pl. xlii, f. 14–17, 1883.
Green River group: Florissant and Green River, Colorado.

Rhus bella? Heer. Fl. Foss. Arct., vol. ii, abt. iv, p. 482, pl. lvi, f. 3–5 1869; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 407, 1872 [1873]. [Not afterwards mentioned by Lesquereux.]
———?: Six miles above Spring Canyon, Montana.

Rhus Bendirei Lx. Proc. U. S. Nat. Mus., vol. xi, p. 15, pl. ix, f. 2, 1888.
Miocene: John Day Valley, Oregon.

Rhus Boweniana Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 29, pl. ix, f. 8, 9, 1878.
Miocene: Chalk Bluffs? California.

Rhus cassioides Lx. Cret. and Tert. Fl., p. 193, pl. xli, f. 11, 1883.
Green River group: Florissant, Colorado.

Rhus coriarioides Lx. Cret. and Tert. Fl., p. 193, pl. xli, f. 3, 1883.
Green River group: Florissant, Colorado.

Rhus deleta Heer. Fl. Tert. Helv., vol. iii, p. 83, pl. cxxvii, f. 8; pl. cliv, f. 26, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., 1871, suppl., p. 12, 1871 [1872]. [Not afterwards referred to by Lesquereux.]
Laramie group?: Evanston, Wyoming.

Rhus dispersa Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 32, pl. i, f. 23, 1878.
Miocene: Table Mountain, California.

Rhus? drymeja Lx.=Myrica drymeja.

Rhus Evansii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 293, 1871 [1872]; Tert. Fl., p. 291, pl. l, f. 4; pl. lviii, f. 5-9, 1878.
Laramie group?: Evanston, Wyoming.

Rhus fraterna Lx. Cret. and Tert. Fl., p. 192, pl. xli, f. 1, 2, 1883.
Green River group: Florissant, Colorado.

Rhus frigida Kn. Proc. U. S. Nat. Mus., vol. xvii, p. 227, pl. ix, f. 6, 1894.
Eocene?: Herendeen Bay, Alaska.

Rhus Haydenii Lx.=Weinmannia Haydenii.

Rhus Heüfleri Heer. Fl. Tert. Helv., vol. iii, p. 85, pl. cxxvii, f. 3-6, 1859; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 26, 1888.
Miocene?: Corral Hollow, California.

Rhus Hillisæ Lx. Cret. and Tert. Fl., p. 194, pl. xli, f. 12-15, 1883.
Green River group: Florissant, Colorado.

Rhus membranacea Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 369, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 306, 1874 [1876]; Tert. Fl., p. 292, pl. lxiv, f. 6, 7, 1878.
Montana formation?: Point of Rocks, Wyoming.

Rhus metopioides Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 31, pl. viii, f. 12, 13, 1878.
Miocene: Table Mountain, California.

Rhus mixta Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 30, pl. ix, f. 13, 1878.
Miocene: Chalk Bluffs, California.

Rhus myricæfolia Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 31, pl. i, f. 5-8, 1878.
Miocene: Chalk Bluffs, California.

Rhus nervosa Newby. Later Extinct Floras, p. 53, 1868.
Fort Union group: Fort Union, North Dakota.

Rhus payettensis Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 733, pl. ci, f. 6, 7, 1898.
Payette formation: Marsh, Idaho.

Rhus Powelliana Lx. Fl. Dak. Gr., p. 155, pl. lvi, f. 4, 5, 1892.
Dakota group: Kansas.

Rhus psuedo-Meriani Lx. = Quercus doljensis.

Rhus rosæfolia Lx. Tert. Fl., p. 293, pl. xlii, f. 7–9, 1878.
  Weinmannia rosæfolia Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 415, 1873 [1874].
  Green River group: Near Florissant, Colorado.

Rhus subrhomboidalis Lx. Cret. and Tert. Fl., p. 195, pl. xli, f. 16–19, 1883.
  Green River group: Florissant, Colorado.

Rhus trifolioides Lx. Cret. and Tert. Fl., p. 196, 1883.
  Green River group: Florissant, Colorado.

Rhus typhinoides Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 29, pl. ix, f. 1–6, 1878.
  Miocene: Table Mountain, California.

Rhus Uddeni Lx. Fl. Dak. Gr., p. 154, pl. lvii, f. 2, 1892.
  Dakota group: Kansas.
  Cheyenne sandstone: Belvidere, Kansas.

Rhus vexans Lx. Cret. and Tert. Fl., p. 195, pl. xli, f. 20, 1883.
  Green River group: Florissant, Colorado.

Rhus? Westii Kn. in Lx. Fl. Dak. Gr., p. 154, pl. xxxviii, f. 9, 10, 1892.
  Dakota group: Kansas.

Rhus Winchellii Lx. Cret. and Tert. Fl., p. 236, 1883.
  Fort Union group: Yellowstone Valley.

Rhus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 145, 1897.
  Fort Union group: Black Buttes, Wyoming.

Rhus? sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 133, 1897.
  Laramie group: Lance Creek, Converse County, Wyoming.

ROGERSIA Fontaine. Potomac Fl., p. 287, 1889.

Rogersia angustifolia Font. Potomac Fl., p. 288, pl. cxliii, f. 2; cxlix, f. 4, 8; cl, f. 2–7, 1889.
  Potomac formation: Fredericksburg, Virginia.

Rogersia longifolia Font. Potomac Fl., p. 287, pl. cxxxix, f. 6; cxliv, f. 2; cl, f. 1; clix, f. 1, 2, 1889.
  Potomac formation: Kankeys, near Dutch Gap Canal, and Fredericksburg, Virginia.

ROSA Tournefort. Ex Linnæus, Syst., ed. i, p. 1735.

Rosa Hilliæ Lx. Cret. and Tert. Fl., p. 199, pl. xl, f. 16, 17, 1883.
  Green River group: Florissant, Colorado.

ROSELLINITES (De Not.) Meschinelli, Sylloge Fung. Foss., p. 14, 1892.

Rosellinites lapideus (Lx.) n. comb.
  Sphærites lapideus (Lx.) Meschinelli. Sylloge Fung. Foss., p. 30, 1892.
  Spheria lapidea Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 373, 1872 [1873]; Tert. Fl., p. 34, pl. i, f. 3, 1878.
  Laramie group: Raton Mountains, Colorado.

SABAL Adanson. Fam. Pl., vol. ii, p. 495, 1763.

Sabal Campbelli Newby.= Sabalites Campbelli.

Sabal communis Lx.= Flabellaria eocenica.

Sabal goldiana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 377, 1872 [1873]. [Not afterwards referred to by Lesquereux. Same as Sabalites Campbelli?]

———?: Golden, Colorado.

Sabal Grayana Lx. = Sabalites Grayanus.

Sabal imperialis Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 26, pl. vi, f. 23–23*b*, 1882 [1883]; op. cit., vol. xi, sec. iv, p. 57, pl. xiv, f. 61, 1893 [1894].

Sabal sp. Newby. Bost. Journ. Nat. Hist., vol. vii, p. 515, 1863.

Upper Cretaceous: Nanaimo; Port McNeill.

Sabal major ? (Ung.) Heer. Fl. Tert. Helv., vol. i, p. 88, pl. xxxv; pl. xxxvi, f. 1, 2, 1855; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 295, 1871 [1872]. [Not afterwards recognized. Probably referred to Sabalites Campbelli.]

Flabellaria major Ung. Chlor. Prot., p. 42, pl. xiv, f. 2, 1842.

Eocene?: Head of Snake River, Yellowstone National Park.

Sabal Powellii Newby. Proc. U. S. Nat. Mus., vol. v, p. 504, 1882 [1883].

Eocene: Green River, Wyoming.

Sabal sp., Newby. = Sabal imperialis.

SABALITES Saporta. Études ii; Ann. d. Sci. Nat., 5th ser., vol. iii, p. 77, 1865.

Sabalites Campbelli (Newby.) Lx. Tert. Fl., p. 113, 1878.

Sabal Campbelli Newby. Bost. Journ. Nat. Hist., vol. vii, p. 515, 1863; Later Extinct Floras, p. 41, 1868.

Denver group: Golden, Colorado.

Fort Union group: Yellowstone River, Montana.

Laramie group: Raton Mountains, and Gehrungs, Colorado; Black Buttes, Wyoming.

———?: Vancouver, British Columbia, etc.

Sabalites fructifer Lx. ex. p. Tert. Fl., p. 114, pl. xi, f. 3, 3*a*, 1878.

Flabellaria? fructifera Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1873 [1874].

Denver group: Golden, Colorado.

Sabalites fructifer Lx. [Tert. Fl., pl. xi, fig. 3*a* and fruit on fig. 3b] = Nyssa? racemosa.

Sabalites Grayanus Lx. Tert. Fl., p. 112, pl. xii, f. 1, 2, 1878.

Sabal Grayana Lx. Trans. Am. Phil. Soc., vol. xiii, p. 412, pl. xiv, f. 4–6, 1869.

Eolignitic: Mississippi and Arkansas.

Laramie group: Golden, Colorado; Point of Rocks, Wyoming.

———?: Pleasant Park, California.

SAGENOPTERIS Presl. In Sternberg Vers., vol. ii, p. 164, 1838.

Sagenopteris elliptica Font. Potomac Fl., p. 149, pl. xxvii, f. 9, 11–17, 1889.

Potomac formation: Near Potomac Run and Kankeys, Virginia; Baltimore, Md.

Sagenopteris latifolia Font. Potomac Fl., p. 148, pl. xxvii, f. 10, 1889.
Potomac formation: Near Telegraph Station, Virginia.
Horsetown beds: Shasta County, California.

Sagenopteris Mantelli (Dunk.) Schenk. Deutsch. Weald. Fl., Palæontogr., vol. xix p. 222, 1871; Font., in Diller and Stanton, Bull. Geol. Soc. Am., vol. v, p. 450, 1894.
Knoxville beds: Tehama County, California.

Sagenopteris virginiensis Font. Potomac Fl., p. 150, pl. cxxxviii, f. 13; cxxxix, f. 1, 1889.
Potomac formation: Fredericksburg, Virginia.

Sagenopteris sp., Font in Diller and Stanton. Bull. Geol. Soc. Am., vol. v, p. 450, 1894.
Knoxville beds: Tehama County, California.

SAGITTARIA Ruppius. Ex Linnæus. Syst., ed. i, 1735.

Sagittaria Victor-Masoni Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 354, pl. iii, f. 5, 1895.
Potomac formation: Mount Vernon, Virginia.

Sagittaria pulchella Heer. Fl. Foss. Alask., p. 25, pl. i, f. 15, 1869.
Eocene?: Alaska.

Sagittaria n. sp.? Lx. Proc. U. S. Nat. Mus., vol. x, p. 37, 1887.
Eocene?: Sitka, Alaska.

SALICIPHYLLUM Fontaine. Potomac Fl., p. 302, 1889.

Saliciphyllum ellipticum Font. Potomac Fl., p. 303, pl. cxlvi, f. 2, 4; cl, f. 8; clxiii, f. 5; clxvi, f. 2, 1889.
Potomac formation: near Dutch Gap Canal, Fredericksburg, and near Brooke, Virginia.

Saliciphyllum longifolium Font. Potomac Fl., p. 302, pl. cl, f. 12, 1889.
Potomac formation: near Potomac Run, Virginia.

Saliciphyllum parvifolium Font. Potomac Fl., p. 303, pl. clxxii, f. 5, 1889.
Potomac formation: Baltimore, Maryland.

Salisburia adiantoides Ung.=Ginkgo adiantoides.
Salisburia biternata Lx.=Ginkgo biternata.
Salisburia (Ginkgo) lepida Heer. Dn.=Ginkgo lepida.
Salisburia nana Dn.=Ginkgo nana.
Salisburia pusilla Dn.=Ginkgo pusilla.
Salisburia (Ginkgo) sibirica Heer Dn.=Ginkgo sibirica.
Salisburia, nuts of, Dn.=Ginkgo sp.

Salisburia, nutlets of, Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 17, 1885 [1886].
Lower Laramie group: Canada.

SALIX (Tournefort.) Linnæus. Syst., ed. i, 1735.

Salix amygdalæfolia Lx. Cret. and Tert. Fl., p. 156, pl. xxxi, f. 1, 2, 1883.
Green River group: Florissant, Colorado.
Miocene: John Day Valley, Oregon.

Salix angusta Al. Br. In Buckl. Geol.; also in Stizenberger Verst., p. 77, 1851; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 6, 1871 [1872]; Tert. Fl., p. 168, pl. xxii, f. 4, 5, 1878.
Green River group: Green River Station, Wyoming.
Tertiary: Montana, Wyoming, Kentucky, California, etc.

Salix californica Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 10, pl. i, f. 18–20, 1878.
Miocene: Table Mountain, California.

Salix cuneata Newby. Later Extinct Floras, p. 21, 1868.
Dakota group: Mouth of Big Sioux, Nebraska.

Salix deleta Lx. Fl. Dak. Gr., p. 49, pl. iii, f. 8, 1892.
Dakota group: Kansas.

Salix densinervis Lx. Am. Journ. Sci., vol. xxvii, p. 364, 1859; Geol. Tenn., p. 427, pl. K, f. 9, 1869.
Pleistocene?: Somerville, Fayette County, Tennessee.

Salix elliptica Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 10, pl. i, f. 22, 1878.
Miocene: Chalk Bluffs, California.

Salix elongata O. Web. Palæontogr., vol. ii, p. 177, pl. xix, f. 10, 1853; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 372, 1872 [1873]; Tert. Fl., p. 169, pl. xxii, f. 6, 7, 1878.
Green River group: Elko Station, Nevada.

Salix Engelhardti Lx. Proc. U. S. Nat. Mus., vol. xi, p. 17, pl. viii, f. 2, 1888.
Miocene: John Day Valley, Oregon.

Salix evanstoniana Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 10, 1871 [1872]. [Not afterwards mentioned by author.]
Laramie group?: Evanston, Wyoming.

Salix flexuosa Newby. = Salix proteæfolia flexuosa.

Salix groenlandica Heer. Fl. Foss. Arct., vol. i, p. 101, pl. iv, f. 8–10, 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 296, 1871 [1872]. [Not afterwards recognized by Lesquereux.]
Laramie group? Six miles above Spring Canyon, Montana.

Salix Hayei Lx. Fl. Dak. Gr., p. 48, pl. iii, f. 7, 1891.
Dakota group: Kansas.

Salix inæqualis Newby. Fl. Amboy Clays, p. 67, pl. xvi, f. 1, 4, 6; xvii, f. 2–7, 1895 [1896].
Amboy clay: Woodbridge, New Jersey.

Salix integra Göpp. Zeitschr. Deutsch. Geol. Gesell., vol. iv, p. 493, 1852; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 397, 1873 [1874]; Tert. F., p. 167, pl. xxii, f. 1, 2, 1878.
———: Black Buttes, Wyoming; Golden, Colorado; Corral Hollow, California.

Salix islandicus Lx. Am. Journ. Sci., vol. xxvii, p. 360, 1859.
———: Bellingham Bay.

Salix kamloopsiana Dn. Trans. Roy. Soc., Canada, vol. viii, sec. iv, p. 90, f. (in text) 32, 1890.
Eocene?: Kamloops, British Columbia.

Salix laramiana Dn. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 28, pl. i, f. 10, 1886 [1887].
Upper Laramie group: Great Valley.

Salix Lavateri Heer. Fl. Tert. Helv., vol. ii, p. 28, pl. lxvi, f. 1-12, 1856; Fl. Foss. Alask., p. 27, pl. ii, f. 10, 1869.
Eocene?: Port Graham Alaska.
———?: Sams Creek, Oregon.

Salix Libbeyi Lx. Cret. and Tert. Fl., p. 156, pl. xxxi, f. 3, 1883.
Green River group: Florissant, Colorado.

Salix macrophylla Heer. Fl. Tert. Helv., vol. ii, p. 29, pl. lvii, 1856; Fl. Foss. Alask., p. 27, pl. ii, f. 9, 1869.
Eocene?: Port Graham, Alaska.

Salix media Heer. Fl. Tert. Helv., vol. ii, p. 32, pl. i, f. 9 f; lxviii, f. 14-19, 1856; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 6, 1871 [1872]; Tert. Fl., p. 168, pl. xxii, f. 3, 1878.
Green River group: Green River, Wyoming; Elko Station, Nevada.
Eolignitic: Wickliffe, Kentucky.

Salix Meekii Newby. Later Extinct Floras, p. 19, 1868.
Dakota group: Blackbird Hill, Nebraska.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Salix membranacea Newby. Later Extinct Floras, p. 19, 1868; Fl. Amboy Clays, p. 66, pl. xxix, f. 12, 1895 [1896].
Amboy clay: Sayreville, New Jersey.

Salix minuta Kn. Proc. U. S. Nat. Mus., vol. xvii, p. 218, pl. ix, f. 1, 1894.
Eocene?: Herendeen Bay, Alaska.

Salix nervillosa Heer. Phyll. Crét. d. Nebr., p. 15, pl. i, f. 3, 1866; Lx., Fl. Dak. Gr., p. 49, 1892.
Dakota group: Tehama, Nebraska.

Salix Newberryana Hollick in Newby. Fl. Amboy Clays, p. 68, pl. xiv, f. 2-7, 1895 [1896].
Amboy clay: New Jersey.

Salix pacifica Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 26, pl. vii, f. 24, 1882 [1883].
Upper Cretaceous: Baynes Sound.

Salix proteæfolia Lx. Am. Journ. Sci., vol. xlvi, p. 94, 1868; Rept. on Clay in N. J., p. 29, 1878.
Dakota group: Decatur, Nebraska.
Amboy clay: Woodbridge and Sayreville, New Jersey.
Cretaceous: Marthas Vineyard.

Salix proteæfolia flexuosa (Newby.) Lx. Fl. Dak. Gr., p. 50, pl. xliv, f. 4, 5, 1892.

Salix flexuosa Newby. Later Extinct Floras, p. 21, 1868; Ill. Cret. and Tert. Pl., pl. i, f. 4, 1878.

Dakota group: Kansas.

Cretaceous: Seacliff, Long Island.

Salix proteæfolia lanceolata Lx. Fl. Dak. Gr., p. 50, pl. lxiv, f. 6–8, 1892.

Dakota group: Ellsworth County, Kansas.

Salix proteæfolia linearifolia Lx. Lx. Fl. Dak. Gr., p. 49, pl. lxiv, f. 1–3, 1892.

Dakota group: Kansas.

Salix proteæfolia longifolia Lx. Fl. Dak. Gr., p. 50, pl. lxiv, f. 9, 1892.

Dakota group: Ellsworth County, Kansas.

Salix purpuroides Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 50, pl. clxxiv, f. 9, 1894.

Cretaceous: Seacliff, Long Island.

Salix Ræana Heer. Fl. Foss. Arct., vol. i, p. 102, pl. iv, f. 11–13; pl. xlvii, f. 11, p. 139; pl. xxi, f. 13, 1868.

Eocene?: Cook Inlet, Alaska.

Miocene?: Mackenzie River; John Day Valley, Oregon.

Lignitic tertiary: Great Valley.

Salix Schimperi Lx. Proc. U. S. Nat. Mus., vol. xi, p. 21, pl. xiii, f. 5, 1888.

Eocene?: Cherry Creek, Oregon.

Salix tabellaris Lx. Trans. Am. Phil. Soc., vol. xiii, p. 414, pl. xvii, f. 4, 1869.

Eolignitic: Mississippi.

Salix varians Göpp. Zeitschr. d. Deutsch. Geol. Gesell, vol. iv, p. 493, 1852; Tert. Fl. v. Schossnitz, p. 26, pl. xix, f. 17, 18; xx, f. 1, 2, 1855; Heer, Fl. Foss. Alask., p. 27, pl. ii, f. 8; iii, f. 1–3, 1869.

Eocene?: English Bay; Neniltochik, Alaska.

Salix Worthenii Lx. Trans. Am. Phil. Soc., vol. xiii, p. 414, pl. xv, f. 7, 1869.

Eolignitic: Lagrange, Tennessee; Mound City, Illinois.

Salix sp., Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 32, pl. ii, f. 15, 16, 1892.

Cretaceous: Staten Island.

Salix sp., Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 57, pl. vii, f. 22, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver.

Salix sp., Newby. Fl. Amboy Clays, p. 68, pl. xlii, f. 6–8, 1895 [1896].

Amboy clay: No location.

Salix sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 140, 1897.

Montana formation: Near Harpers, Wyoming.

Salix sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 134, 1897.
Fort Union group: Lightning Creek, Converse County, Wyoming.
Salix sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 148, 1897.
Laramie group: Rock Springs, Wyoming.
Salix, fruiting catkin of, Lx. Fl. Dak. Gr., p. 51, pl. viii, f. 6, 1892.
Dakota group: Near Delphos, Kansas.

SALVINIA Adanson. Fam. Pl., vol. ii, p. 15, 1763.
Salvinia Alleni Lx. = Tmesipteris Alleni.
Salvinia attenuata Lx. = Marsilea attenuata.
Salvinia cyclophylla Lx. = Phyllites cyclophylla.
Salvinia elliptica Newby. Mss. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 255, pl. ccv, f. 14, 14*a*, 15, 1894.
Upper Cretaceous?: Carbonado, Washington.
Salvinia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 133, 1897.
Laramie group: Lance Creek, Converse County, Wyoming.

SANTALUM Linnæus. Gen., ed. 2, p. 165, 1742.
Santalum Americanum Lx. Cret. and Tert. Fl., p. 164, pl. xxxii, f. 7, 1883.
Green River group: Florissant, Colorado.

SAPINDOPSIS Fontaine. Potomac Fl., p. 296, 1889.
Sapindopsis brevifolia Font. Potomac Fl., p. 300, pl. cliii, f. 4; clv, f. 1, 7; clxiii, f. 3, 1889.
Potomac formation: Near Brooke, Virginia.
Sapindopsis cordata Font. Potomac Fl., p. 296, pl. cxlvii, f. 1, 1889.
Potomac formation: Fredericksburg, Virginia.
Sapindopsis elliptica Font. Potomac Fl., p. 297, pl. cxlvii, f. 3, 1889.
Potomac formation: Fredericksburg, Virginia.
Sapindopsis magnifolia Font. Potomac Fl., p. 297, pl. cli, f. 2, 3; clii, f. 2, 3; cliii, f. 2; cliv, f. 1, 5; clv, f. 6, 1889.
Potomac formation: Near Brooke and White House Bluff, Virginia.
Sapindopsis obtusifolia Font. Potomac Fl., p. 301, pl. clvi, f. 13; clix, f. 3–6, 1889.
Potomac formation: Deep Bottom and near Brooke, Virginia.
Sapindopsis parvifolia Font. Potomac Fl., p. 300, pl. cliv, f. 6, 1889.
Potomac formation: Near Brooke and White House Bluff, Virginia.
Sapindopsis tenuinervis Font. Potomac Fl., p. 301, pl. cliii, f. 1, 1889.
Potomac formation: Near Brooke, Virginia.
Sapindopsis variabilis Font. Potomac Fl., p. 298, pl. cli, f. 1; clii, f. 1, 4; cliii, f. 3; cliv, f. 2–4; clv, f. 2–5, 1889.
Potomac formation: Near Brooke and White House Bluff, Virginia.

SAPINDUS Tournefort ex. Linnæus. Gen. Pl., ed. i, p. 359, 1737.
Sapindus affinis Newby. Later Extinct Floras, p. 51, 1868.
Fort Union group: Gladstone, Dakota; Great Valley, Montana; Woody Mountains, British Columbia.

Sapindus alatus Ward. Bull. U. S. Geol. Surv., no. 37, p. 68, pl. xxxi, f. 3, 4, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Sapindus americanus Lx. Am. Journ. Sci., vol. xxxii, p. 359, 1861; Geol. Vt., vol. ii, p. 715, f. 142, 143, 144, 145, 1861.
———: Brandon, Vermont.

Sapindus angustifolius Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 415, 1873 [1874]; Tert. Fl., p. 265, pl. xlix, f. 2–7, 1878.
Eocene: Kentucky.
Green River group: Florissant, Colorado.
Eolignitic: Wickliffe, Kentucky.
Miocene: John Day Valley and ? Lanes Creek, Oregon.

Sapindus apiculatus Vel. Fl. Boehm. Kriedefl., Theil iii, p. 6 [53], pl. vii [xxii], f. 1–8, 1884; Hollick, Trans. N. Y. Acad. Sci., vol. xvi, p. 133, pl. xiii, f. 1, 2, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Sapindus caudatus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 380, 1872 [1873]; Tert. Fl., p. 264, pl. xlviii, f. 6, 1878.
Denver group: Golden, Colorado.
Eolignitic?: Cross Lake, Louisiana?

Sapindus coriaceus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 415, 1873 [1874]; Tert. Fl., p. 265, pl. xlix, f. 12–14, 1878.
Green River group: Elko Station, Nevada.
Eolignitic?: ? Cross Lake, Louisiana.

Sapindus Dentoni Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 388, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 315, 1874 [1876]; Tert. Fl. p. 265, pl. lxiv, f. 2–4, 1878.
Green River group?: Mouth White River.

Sapindus diversifolius Lx. Fl. Dak. Gr., p. 158, pl. lxiv, f. 18, 1892.
Dakota group: Kansas.

Sapindus dubius Ung. Denkschr. Wien. Akad., vol. vii (Foss. Fl. v. Gleichenbg.), p. 180 [24], pl. v, f. 11, 1854; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 12, 1888.
Eolignitic: Wickliffe, Kentucky.

Sapindus falsifolius Al. Br. in Stizenberger. Verstein., p. 87, 1851; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 12, pl. iv, f. 4, 1888.
Juglans falsifolia Al. Br. in Buckl. Geol.
Eolignitic: Boaz Station, Graves County, Kentucky.

Sapindus grandifoliolus Ward. Bull. U. S. Geol. Surv., no. 37, p. 67, pl. xxx, f. 3–5; pl. xxxi, f. 1, 2, 1887.
Fort Union group: Seven-Mile Creek, Montana.

Sapindus inflexus Lx. Cret. and Tert. Fl., p. 182, pl. xxxii, f. 2, 1883.
Green River group: Florissant, Colorado.

Sapindus lancifolius Lx. Cret. and Tert. Fl., p. 182, pl. xxxii, f. 3–6; pl. xxxvii, f. 9, 1883.
Green River group: Florissant, Colorado.

Sapindus membranaceus Newby. Later Extinct Floras, p. 52, 1868.
Fort Union group: Fort Union, North Dakota.

Sapindus Morrisoni Lx. Cret. and Tert. Fl., p. 83, pl. xvi, f. 1, 2, 1883; Fl. Dak. Gr., p. 158, pl. xxxv, f. 1, 2, 1892.
Dakota group: Morrison, Colorado; Kansas; New Ulm, Minnesota.
Cretaceous: Glen Cove, Long Island; Marthas Vineyard.

Sapindus obtusifolius Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 419, 1873 [1874]; Tert. Fl., p. 266, pl. xlix, f. 8–11, 1878.
Green River group?: Eight miles southeast of Green River Station, Wyoming.
Fort Union group: Bad Lands, Dakota.

Sapindus stellariæfolius Lx. Tert. Fl., p. 264, pl. xlix, f. 1, 1878.
Green River group: Florissant, Colorado.

Sapindus undulatus Al. Br. in Stizenberger. Verstein, p. 87, 1851; Lx., Trans. Am. Phil. Soc., vol. xiii, p. 420, pl. xxii, f. 6, 1869.
Eolignitic: Mississippi.

Sapindus sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 35, 1887 [1888].
Upper Laramie group: North Saskatchewan.

Sapindus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 142, 1897.
Laramie group?: "Dutton Creek coal," Wyoming.

SAPOTACITES Ettingshausen. Abhandl. d. k. k. Geol. Reichsanstalt. [Tert. Fl. Häring], vol. ii, abt. iii, p. 61, 1853.

Sapotacites americanus Lx. Geol. Tenn., p. 428, pl. K., f. 8, 1869.
Pleistocene?: Somerville, Fayette County, Tennessee.

Sapotacites Haydenii Heer. Proc. Phil. Acad. Sci., vol. x, p. 265, 1858; Newby., Later Extinct Floras, p. 8, 1868.
Dakota group: Kansas.

Sapotacites retusus Heer. Fl. Foss. Arct., vol. vii, p. 32, pl. lxi, f. 10, 1883; Newby., Fl. Amboy Clays, p. 123, pl. liii, f. 5, 6, 1895 [1896].
Amboy clay, Woodbridge, New Jersey.

Sapotacites sp.? Lx. Fl. Dak. Gr., p. 114, pl. lxv, f. 3, 1892.
Dakota group: Kansas.

SASSAFRAS Linnæus. Syst., ed. i, 1735.

Sassafras acutilobum Lx. Cret. Fl., p. 79, pl. xiv, f. 1–2, 1874; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 236, pl. vii, f. 1, 1893.
Dakota group: Salina River, Kansas.
Cretaceous: Glen Cove, Long Island; Marthas Vineyard.
Amboy clay: Woodbridge, New Jersey.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

Sassafras bilobatum Font. Potomac Fl., p. 290, pl. clvi, f. 12; clxiv, f. 4, 1889.
Potomac formation: Near Brooke, Virginia.

Sassafras (Araliopsis) Burpeana Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 17, 1885 [1886]; op. cit., vol. iv., p. 28, pl. ii, f. 11, 1886 [1887].

Canadian upper Laramie: Calgary, Canada.

Sassafras (Araliopsis) cretaceum Newby. Later Extinct Floras, p. 14, 1868; Lx., Ill. Cret. and Tert. Pl., pl. vi, f. 1–4, 1878; Cret. Fl., p. 80, pl. xi, f. 1, 2; xii, f. 2, 1878.

Dakota group: Nebraska and Kansas.

Sassafras (Araliopsis) cretaceum dentatum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 344, 1874 [1876]; Cret. Fl., pl. xi, f. 1, 2.

Dakota group: Kansas?

Sassafras (Araliopsis) cretaceum grossedentatum Lx. Fl. Dak. Gr., p. 101, pl. li, f. 5, 1892.

Dakota group: Kansas.

Sassafras cretaceum heterolobum Font. Potomac Fl., p. 289, pl. clii, f. 5; clix, f. 8; clxiv, f. 5, 1889.

Potomac formation: Near Brooke, Virginia.

Sassafras (Araliopsis) cretaceum obtusum Lx. Cret. Fl., p. 80, pl. xii, f. 3; xiii, f. 1, 1874; Fl. Dak. Gr., p. 102, 1892.

Sassafras (Araliopsis) obtusum Lx., Cret. and Tert. Fl., p. 56, 1883.

Cheyenne sandstone: Belvidere, Kansas.

Dakota group: Kansas.

Sassafras (Araliopsis) dissectum Lx. Cret. and Tert. Fl., p. 57, 1883; Fl. Dak. Gr., p. 101, pl. xiv, f. 1, 1892.

Dakota group: Fort Harker, Kansas.

Sassafras (Araliopsis) dissectum symmetricum Hollick. Bull. Torr. Bot. Club, vol. xxii, no. 5, p. 226, pl. ccxxxvi, 1895.

Dakota group: Fort Harker, Kansas.

Sassafras harkeriana Lx. = Cissites harkerianus.

Sassafras hastatum Newby. Fl. Amboy Clays, p. 88, pl. xxvii, f. 4–6; xxviii, f. 1, 2; xl, f. 4, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Sassafras Leconteanum Lx. = Persea Lecontiana.

Sassafras (Araliopsis) mirabile Lx. Cret. Fl., p. 80. pl. xii, f. 1, 1874; Cret. and Tert. Fl., p. 56, 1883.

Sassafras mirabilis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 424, 1872 [1873].

Platanus latiloba Newby. Later Extinct Floras, p. 23, 1868.

Dakota group: Kansas.

Sassafras Mudgii Lx. Am. Journ. Sci., vol. xlvi, p. 99, 1868; Cret. Fl., p. 78, pl. xiv, f. 3, 4; xxx, f. 7, 1874.

Dakota group: Salina River, Kansas.

Cheyenne sandstone: Belvidere, Kansas.

Sassafras obtusu(s)m Lx. = Cissites salisburiæfolius.

Sassafras (Araliopsis) obtusum Lx. Cret. and Tert. Fl., p. 56] = Sassafras cretaceum obtusum.

Sassafras (Araliopsis) papillosum Lx. Fl. Dak. Gr., p. 102, pl. vi, f. 7, 1892.

Dakota group: Kansas.

Sassafras parvifolium Font. Potomac Fl., p. 289, pl. cxxxix, f. 7, 1889.

Potomac formation: Baltimore, Maryland.

Sassafras (Araliopis) platanoides Lx. Cret. and Tert. Fl., p. 58, pl. vii, f. 1, 1883.

Dakota group: Kansas.

Sassafras? primordiale Lx. Fl. Dak. Gr., p. 100, pl. xvi, f. 10, 1892.

Dakota group: Kansas.

Sassafras progenitor Newby. MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 53, pl. clxxiv, f. 1, 1894; Newby., Fl. Amboy Clays, p. 88, pl. xxvii, f. 1-3, 1895 [1896].

Cretaceous: Oak Neck, Long Island; Marthas Vineyard.

Amboy clay: Woodbridge, New Jersey.

Sassafras (Araliopsis) recurvatum Lx. Cret. and Tert. Fl., p. 57, 1883.

Platanus recurvata Lx. Cret. Fl., p. 71, pl. x, f. 3-5, 1874.

Sassafras recurvatus Lx. Ann. Rept., U. S. Geol. and Geogr. Surv. Terr., p. 424, 1872 [1873].

Dakota group: Near Fort Harker, Kansas.

Sassafras Selwynii Dn. Geol. Surv. Canada, Rept. Prog. for 1879-80, p. 53A, 1881; Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 28, pl. ii, f. 13, 1886 [1887].

Canadian upper Laramie: Souris River.

Sassafras subintegrifolium Lx. Am. Journ. Sci., vol. xlvi, p. 99, 1868; Fl. Dak. Gr., p. 99, pl. xiv, f. 2, 1892.

Dakota group: Kansas.

Sassafras sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 298, 1871 [1872]. [Not afterwards mentioned by Lesquereux.]

Laramie group?: Six miles above Spring Canyon, Montana.

Sassafras (Araliopsis) sp., Lx. Rept. on Clays in N. J., p. 29, 1878.

Amboy clay: Burts Creek, New Jersey.

Sassafras sp., Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 27, pl. vii, f. 30, 30*a*, 1882 [1883].

Upper Cretaceous: Baynes Sound; Vancouver Island.

Sassafras sp., Kn. in Hill. Am. Journ. Sci., vol. l, p. 212, 1895.

Cheyenne sandstone: Belvidere, Kansas.

SCIRPUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Scirpus sp., Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 329, 1875.

Lignitic Tertiary: Porcupine Creek.

Scirpus sp., Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 329, 1875.

Lignitic Tertiary: Porcupine Creek.

SCLEROPTERIS Saporta. Paléontol. Française: Pl. Jurass., vol. i, p. 364, 1873.

Scleropteris dentata Font. Potomac Fl., p. 153, pl. lxiii, f. 3, 4, 1889.

Potomac formation: Fredericksburg, Virginia.

Scleropteris elliptica Font. Potomac Fl., p. 151, pl. xxviii, f. 2, 4, 6; xxix, f. 1, 1889.

Potomac formation: Fredericksburg, near Potomac Run, near Dutch Gap Canal, Kankeys, and near Telegraph Station, Virginia.

Scleropteris elliptica longifolia Font. Potomac Fl., p. 152, pl. xxviii, f. 7, 1889.

Potomac formation: Fredericksburg, Virginia.

Scleropteris vernonensis Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 349, pl. ii, f. 1–3, 1895.

Potomac formation: Mount Vernon, Virginia.

Scleropteris virginica Font. Potomac Fl., p. 152, pl. xxviii, f. 3, 5, 1889.

Potomac formation: Dutch Gap Canal, Virginia.

SELAGINELLA Beauvois. Prodr. Ætheog., p. 101, 1805.

Selaginella Berthoudi Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 395, 1873 [1874]; Tert. Fl., p. 46, pl. v, f. 12, 12*a*, 1878.

Denver group: Golden, Colorado.

Selaginella falcata (Lx.) Emend. Kn.

Selaginella? falcata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 365, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 297, 1874 [1876; Tert. Fl., p. 46, pl. lxi, f. 12–15 [non pl. lxiv, f. 13, 13*a*], 1878.

Montana formation: Point of Rocks, Wyoming.

Selaginella falcata Lx. Ex. p. [Tert. Fl., pl. lxiv, f. 13, 13*a*] = Lycopodium Lesquereuxii.

Selaginella laciniata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 378, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 297, 1874 [1876]; Ter. Fl., p. 47, pl. lxiv, f. 12, 12*a*, 1878.

Montana formation: Point of Rocks, Wyoming.

SCLEROTITES Meschinelli. Syllog. Fung. Foss., p. 67 [803], 1892.

Sclerotites rubellus (Lx.) Meschinelli. Syllog. Fung. Foss., p. 69 [805], 1892.

Sclerotium rubellum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 375, 1872 [1873]; Tert. Fl., p. 35, pl. i, f. 2, 2*f*, 1878.

Denver group: Golden, Colorado.

Sclerotites sp. (Lx.) n. comb.

Sclerotium sp., Lx. Fl. Dak. Gr., p. 23, pl. lix, f. 4, 4*a*, 1891.

Dakota group.

Sclerotium rubellum Lx. = Sclerotites rubellus.

Sclerotium sp. Lx. = Sclerotites.

SEQUOIA Endlicher. Synop. Conif., p. 197, 1847.

Sequoia acuminata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 384, 1875 [1876]; Tert. Fl., p. 80, pl. vii, f. 15–16*a*, 1878.

Laramie group: Black Buttes, Wyoming.

Sequoia acutifolia Newby. Am. Journ. Sci., vol. xli, p. 200, pl. xiv, f. 7, 7*a*, 1891.

Kootanie: Great Falls, Montana.

Sequoia affinis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 384, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 310, 1874 [1876]; Tert Fl., p. 75, pl. vii, f. 3–5; pl. lxv, f. 1–4, 1878.

Sequoia Langsdorffi Brongn. Lx., Ann. Rept., p. 400, 1874 [1876]; Tert. Fl., p. 76, 1878.

Green River group: Florissant, Colorado; Elko Station, Nevada.

Sequoia ambigua Heer. Fl. Foss. Arct., vol. iv, abt. ii, p. 78, pl. xxi, 1874; Font., Potomac Fl., p. 245, pl. cxviii, f. 2; cxx, f. 1–6; cxxvii, f. 5; cxxxii, f. 3, 1889.

Cretaceous: Marthas Vineyard.

Kootanie: Great Falls, Montana.

Potomac formation: Near Dutch Gap Canal and near Telegraph Station, Virginia.

Sequoia angustifolia Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 372, 1872 [1873]; Tert. Fl., p. 77, pl. vii, f. 6–10, 1878; Cret. and Tert. Fl., p. 240, pl. l, f. 5, 1883.

Green River group: Elko Station, Nevada.

Miocene: Corral Hollow, California.

Sequoia biformis Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., p. 366, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 298, 1874 [1876]; Tert. Fl., p. 80, pl. lxii, f. 15–18a, 1878; Ward, Bull. U. S. Geol. Surv., no. 37, p. 16, pl. i, f. 1–6, 1887.

Montana formation: Point of Rocks, Wyoming.

Sequoia brevifolia Heer. Fl. Foss. Arct., vol. i, p. 93, pl. ii, f. 23, 1868; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 365, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 298, 1874 [1876]; Tert. Fl., p. 78, pl. lxi, f. 25–27, 1878.

Montana formation: Point of Rocks, Wyoming.

Sequoia condita Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 391, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 335, pl. iv, f. 5–7, 1874 [1876]; Cret. and Tert. Fl., p. 32, pl. i, f. 5–7, 9, 1883; Rept. on Clays in N. J., p. 29, 1878.

Dakota group: Kansas.

Amboy clay: Sayreville, New Jersey?

Sequoia Couttsiæ Heer. Phil. Trans., vol. clii, pt. ii, p. 1051, pls. lix, lx, lxi, 1862; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 30, pl. i, f. 5, 1892.

Cretaceous: Staten Island.

Canadian upper Laramie: North Saskatchewan.

Sequoia cycadopsis Font. Potomac Fl., p. 243, pl. cxii, f. 9–11; cxiii, f. 1–3, 1889.

Potomac formation: Near Brooke, Virginia.

Sequoia delicatula Font. Potomac Fl., p. 247, pl. cxxi, f. 3, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

Sequoia densifolia Font. Potomac Fl., p. 246, pl. cxxi, f. 4, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

Sequoia fastigiata (Sternbg.) Heer. Neue. Denkschr. Schw. Ges., vol. xxiii, Mém. 2, p. 11, pl. i, f. 10–13, 1869; Lx., Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 391, 1875 [1876]; Cret. and Tert. Fl., p. 31, 1883; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 335, pl. iii, f. 2, 8, 1874 [1876].

Caulerpites fastigiatus Sternbg. Vers., vol. ii, p. 23, 1833.

Dakota group: Kansas.

Sequoia formosa Lx. Am. Journ. Sci., vol. xlvi, p. 92, 1868.

Dakota group: Decatur, Nebraska.

Sequoia gracillima (Lx.) Newby. Fl. Amboy Clays, p. 50, pl. ix, f. 1–3, 1895 [1896].

Glyptostrobus gracillimus Lx. Am. Journ. Sci., 2d ser., vol. xlvi, p. 92, 1868; Cret. Fl., p. 52, pl. i, f. 8, 11–11*f*, 1874; Cret. and Tert. Fl., p. 32, pl. i, f. 6–6*b*, 1883.

———?: Forks of Pine River, Northwest Territory.

Amboy clay: Keyport, New Jersey.

Cheyenne sandstone: Belvidere, Kansas.

Dakota group: Sioux City, Iowa.

Sequoia gracilis Heer. Fl. Foss. Arct., vol. iii, abt. ii, abt. 80, 1873; Font., Potomac Fl., p. 247, pl. cxxvi, f. 3, 4, 1889.

Potomac formation: Near Brooke, Virginia.

Kootanie: Great Falls, Montana.

Sequoia Heerii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 290, 1871 [1872]; Tert. Fl., p. 77, pl. vii, f. 11–13, 1878.

Green River group?: Sage Creek,? Montana.

Sequoia heterophylla Vel. Gymnosp. d. Böhm. Kreidf., p. 22, pl. xii, f. 2–4, 6–9; xiii, f. 12, 1885; Newby., Fl. Amboy Clays, p. 49, pl. vi, f. 1–13, 1895 [1896].

Amboy clay: New Jersey; Kreischerville, Staten Island.

Sequoia Langsdorfii (Brgt.) Heer. Fl. Tert. Helv., vol. i, p. 54, pl. xx, f. 2; xxi, f. 4, 1855; Lx., Tert. Fl., p. 76, 1878.

Taxites Langsdorfii Brongn. Prod. Hist. Vég. Foss., p. 108, 1828.

Miocene: John Day Valley, Oregon; Mackenzie River.

Green River group: Florissant, Colorado.

Eocene: Alaska.

Fort Union group: Montana; Porcupine Creek, Canada.

Upper Cretaceous: Nanaimo.

Sequoia Langsdorfii var. Heer. Fl. Foss. Alask., p. 23, pl. i, f. 10*b*, 1869.

Eocene?: Near Sitka, Alaska.

Sequoia longifolia Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 365, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 298, 1874 [1876]; Tert. Fl., p. 79, pl. vii, f. 14, 14*a*; pl. lxi, f. 28, 29.

Montana formation: Point of Rocks, Wyoming; Coalville, Utah.

Laramie group: Greely, Coal Creek, and Marshalls, Colorado.

Sequoia Langsdorffi Brongn. Lx. [Ann. Rept. 1874, p. 410] = Sequoia affinis.

Sequoia Nordenskiöldii Heer. Fl. Foss. Arct., vol. ii, abt. iii, p. 36, pl. ii, f. 13*b*; iv, f. 1*a*, *b*, 4–38, 1870; Lx., Proc. U. S. Nat. Mus., vol. xi, p. 19, 1888.

Miocene: John Day Valley, Oregon; Mackenzie River.

Canadian upper Laramie: Porcupine Creek, Great Valley.

Sequoia pagiophylloides Font. Proc. U. S. Nat. Mus., vol. xvi, p. 276, pl. xlii, f. 1–3*a*, 1893.

Trinity division: Glenrose, Texas.

Sequoia Reichenbachi (Gein.) Heer. Fl. Foss. Arct., vol. i, p. 83; pl. xliii, f. 1*d*, 2*b*, 5*a*, 1868; Lx., Cret. Fl., p. 51, pl. i, f. 10–10*b*, 1874; Fl. Dak. Gr., p. 35, pl. ii, f. 4, 1892; Hollick, Trans. N. Y. Acad. Sci., vol. xii, p. 30, pl. i, f. 18, 1892; Font., Potomac Fl., p. 243, pl. cxviii, f. 1, 4; cxix, f. 1–5; cxx, f. 7, 8; cxxii, f. 2; clxvii, f. 5, 1889; Dn., Trans. Roy. Soc. Canada, 1882, p. 21, 1882; Newby., Fl. Amboy Clays, p. 49, pl. ix, f. 19, 1895 [1896].

Avancarites Reichenbachi Gein. Charakteristik, heft iii, p. 98, pl. xxiv, f. 4, 1842.

Abietites dubius Lx. Tert. Fl., p. 81, pl. vi, f. 20, 21, 21*a*, 1878.

Livingston beds: Bozeman coal field, Montana.

Montana formation: Point of Rocks, Wyoming.

Amboy clay: Woodbridge, New Jersey.

Clay marl: Cliffwood, New Jersey.

Belly River series: Belly River, Canada.

Potomac formation: Dutch Gap Canal and Fredericksburg, Virginia.

Dakota group: Fort Harker, Kansas.

Kootanie: Great Falls, Montana.

Sequoia Reichenbachi longifolia Font. Potomac Fl., p. 244, pl. cxvii, f. 8, 1889.

Potomac formation: Near Dutch Gap Canal and Fredericksburg, Virginia.

Sequoia rigida Heer. Fl. Foss. Arct., vol. iii, p. 80, pl. xxii, f. 5*g*, 11*a*, 1873; Font., Potomac Fl., p. 246, pl. cxviii, f. 3; cxxi, f. 2; cxxvi, f. 2; cxxx, f. 3, 1889.

Potomac formation: Near Telegraph Station and near Potomac Run, Virginia.

Kootanie: Great Falls, Montana.

Sequoia Smittiana Heer. Zeitschr. d. deutsch. geol. Gesell. 1872, p. 161, 1872; Dn., Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 9, pl. ii, f. 7, 7*a*, 1885 [1886].

Amboy clay?: Sayreville, New Jersey?

Kootanie: Coal Creek, Crows Nest Pass and Middle Fork North Branch Old Man River, British Columbia; Great Falls, Montana.

Sequoia spinosa Newby. Proc. U. S. Nat. Mus., vol. v, p. 504, 1882 [1883].

Eocene? Cook Inlet, Alaska.

Sequoia subulata Heer. Zeitschr. d. deutsch. geol., Gesell. 1872, p. 162, 1872; Font., Potomac Fl., p. 245, pl. cxvii, f. 7, cxviii, f. 5, 6, 1889.
Potomac formation: Near Dutch Gap Canal, near Telegraph Station, and Fredericksburg, Virginia.
Amboy clay?: Sayreville, New Jersey?

Sequoia Winchelli Lx. Geol. and Nat. Hist. Surv. Minn., vol. iii, p. 10, pl. A, f. 1, 1893.
Dakota group: Austin, Minnesota.

Sequoia sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 34, 1887. [Wood.]
Upper Laramie group: Turtle Mountain.
Lignitic: Souris Valley.
Middle lignitic: Two hundred and forty-five-Mile Valley; Wood End Depot; Mackenzie River; Edmonton, British Columbia.

Sequoia sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 34, 1887. [Wood.]
Canadian upper Laramie: Wood End Depot; Coteau; Mackenzie River.

Sequoia sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 32, 1887. [Wood.]
Belly River series: Ribstone Creek; Saskatchewan River, British Columbia.

Sequoia sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 32, 1887. [Wood.]
Fort Pierre group: Bow River, Canada.
Belly River series: Ribstone Creek; west of Medicine Hat.

Sequoia sp., Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 80, f. (in text) 8, 1890 [1891].
———: Stump Lake, British Columbia.

Sequoia sp., Font. Potomac Fl., p. 247, pl. cxx, f. 9, 1889.
Potomac formation: Fredericksburg, Virginia.

Sequoia sp., Font. Potomac Fl., p. 248, pl. cxvi, f. 7; cxxxii, f. 2, 5, 6, 1889.
Potomac formation: Near Brooke and Fredericksburg, Virginia.

Sequoia sp., Font. Potomac Fl., p. 248, pl. cxxxii, f. 10, 1889.
Potomac formation: Fredericksburg, Virginia.

Sequoia sp., Kn. in Hill. Am. Journ. Sci., vol. l, p. 212, 1895.
Cheyenne sandstone: Belvidere, Kansas.

Sequoia sp.? Kn. Bull. Geol. Soc. Am., vol. viii, p. 134, 1897.
Fort Union group: Lightning Creek, Converse County, Wyoming.

Sequoia sp., Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 384, 1875 [1876].
Laramie group: Black Buttes, Wyoming.

Sequoia? sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 310, 1874 [1876].
———?: Middle Park, Colorado.

Sequoia sp., Lx. Rept. on Clays in N. J., p. 29, 1878.
Amboy clay: Burts Creek, New Jersey.
Sequoia sp., Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 723, 1898.
Payette formation: Marsh, Idaho.

SERENOPSIS Hollick. Bull. Torr. Bot. Club, vol. xx, p. 169, 1893.
Serenopsis Kempii Hollick. Bull. Torr. Bot. Club, vol. xx, p. 169, pl. cxlix, 1893; ibid., vol. xx, p. 334, 335, pl. clxvi, 1893.
Cretaceous: Glen Cove, Long Island.
Smilacites grandifolia Ung. = Smilax grandifolia.

SMILAX (Tournefort) Linnæus. Syst., ed. i, 1735.
Smilax cyclophylla Newby. Bost. Journ. Nat. Hist., vol. vii, p. 520, 1863.
Miocene?: Birch Bay, Washington.
Smilax Franklini Heer. Fl. Foss. Arct., vol. i, p. 136, pl. xxi, f. 18, 1868.
Miocene?: Mackenzie River.
Smilax grandifolia (Ung.) Heer. Fl. Tert. Helv., vol. i, p. 82, pl. xxx, f. 8, 1855; Lx., Ann. Rept., op. cit., p. 385, 1872 [1873]; Tert. Fl., p. 94, pl. ix, f. 5, 1878.
Smilacites grandifolia Ung. Chlor. Prot., p. 129, pl. xl, f. 3, 1847.
Laramie group?: Carbon, Wyoming.
Laramie group: Canon City, Colorado, etc.
Smilax grandifolia-cretacea Lx. Fl. Dak. Gr., p. 40, pl. xlvi, f. 3, 1892.
Dakota group: Kansas.
Smilax obtusangula? Heer. Fl. Tert. Helv., vol. iii, p. 166, pl. cxlvii, f. 25, 1859; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 391, 1872 [1873]. [Not afterwards mentioned by Lesquereux.]
Laramie group?: Black Buttes, Wyoming.
Smilax undulata Lx. Fl. Dak. Gr., p. 39, pl. xlvi, f. 2, 1892.
Dakota group, Kansas.
Smilax Wardii Lx. Proc. U. S. Nat. Mus., vol. xi, p. 19, pl. xiii, f. 1, 1888.
Miocene; John Day Valley, Oregon.

SPARGANIUM (Tournefort) Linnæus. Syst., ed. i, 1735.
Sparganium stygium Heer. Fl. Tert, Helv., vol. i, p. 101, pl. xlv, f. 1-4, 1855; Ward, Bull. U. S. Geol. Surv., no. 37, p. 18, pl. iii, f. 6, 7, 1887.
Fort Union group: Seven-Mile Creek, Montana.
Sparganium! sp., Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 285, 1871 [1872]. [Not afterwards mentioned by Lesquereux.]
Laramie group?: Three miles above Spring Canyon, Montana.
Spathites sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 140, 1897.
Montana formation: Near Harpers, Wyoming.

SPEGAZZINITES Felix. Zeitschr. d. deutschen geol. Gesell. 1894, p. 279, 1894.

Spegazzinites cruciformis Felix. Zeitschr. d. deutschen geol. Gesell., Jahr. 1894, p. 279, pl. xix, f. 8, 1894; op. cit., Jahr. 1896, p. 255, 1896.

Eocene: Yanceys, Yellowstone National Park.

Sphæria problematica Kn. = Sphærites problematicus.

SPHÆRITES Unger. Gen. et Sp. Pl. Foss., p. 37, 1850.

Sphærites lapideus (Lx.) Mesch. = Rostelliniles lapideus.

Sphærites myricæ (Lx.) Meschinelli. Syllog. Fung. Foss., p. 23, 1892.

Spheria myricæ Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 390, 1872 [1873]; Tert. Fl., p. 34, pl. i, f. 4, 1878.

Green River group: Green River Station, Wyoming.

Laramie group: Black Buttes, Wyoming.

Sphærites Lesquereuxi Meschinelli. Syllog. Fung. Foss., p. 31, 1892.

Spheria rhytismoides Lx. [non Ett., 1869]. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 382, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 308, 1874 [1876]; Tert. Fl., p. 35, pl. i, f. 5, 5*a*, 1878.

Laramie group: Black Buttes, Wyoming.

Sphærites problematicus Kn.

Sphæria problematica Kn. in Lx. Fl. Dak. Gr., p. 23, pl. xxxi, f. 2, 2*a*, 1891.

Dakota group: Kansas.

SPHENOLEPIDIUM Heer. Fl. Foss. du Portugal, p. 19, 1881.

Sphenolepidium dentifolium Font. Potomac Fl., p. 258, pl. cxxvii, f. 3, 4; cxxviii, f. 2–6; cxxix, f. 5; cxxx, f. 4–6, 10, 1889.

Potomac formation: Fredericksburg, Virginia.

Sphenolepidium Kurrianum (Dunk.) Heer. Fl. Foss. du Portugal, p. 19, pl. xii, f. 1*b*; xiii, f. 1*b*, 8*b*; xviii, f. 1–8, 1881; Font., Potomac Fl., p. 260, pl. cxxvi, f. 1, 5, 6; cxxviii, f. 1, 7; cxxix, f. 1, 4, 6, 8; cxxx, f. 11; cxxxi, f. 4; clxvii, f. 2, 1889.

Thuites (Cupressites?) Kurrianus Dunk. Monogr. Norddeutsch. Wealdenbildung., p. 20, pl. vii, f. 8, 1846.

Potomac formation: Dutch Gap Canal, Fredericksburg, near Brooke, and near Telegraph Station, Virginia.

Sphenolepidium pachyphyllum Font. Potomac Fl., p. 259, pl. cxxxi, f. 6, 7, 1889.

Potomac formation: Near Telegraph Station, Virginia.

Kootanie: Anthracite, British Columbia.

Sphenolepidium parceramosum Font. Potomac Fl., p. 257, pl. cxxix, f. 7; cxxx, f. 8; cxxxi, f. 2, 1889.

Potomac formation: Fredericksburg and near Brooke, Virginia.

Sphenolepidium recurvifolium Font. Potomac Fl., p. 258, pl. cxxvii, f. 2; cxxx, f. 2, 7, 1889.

Potomac formation: Near Dutch Gap Canal, near Potomac Run, and near Telegraph Station, Virginia.

Sphenolepidium Sternbergianum (Dunk.) Heer. Fl. Foss. du Portugal, p. 19, pl. xiii, f. 1*a*, 2–8; xiv, 1881; Font., Potomac Fl., p. 261, pl. cxxi, f. 8, 10, 11; cxxx, f. 9, 1889.

Muscites Sternbergianus Dunk. Monogr. Norddeutsch. Wealdenbildung., p. 20, pl. vii, f. 10, 1846.

Potomac formation: Near Potomac Run and Fredericksburg, Virginia.

Sphenolepidium Sternbergianum densifolium Font. Potomac Fl., p. 261, pl. cxviii, f. 7; cxxi, f. 5, 7, 9; cxxv, f. 2; cxxix, f. 3; cxxx, f. 1; cxxxi, f. 1, 3; cxxxii, f. 4, 1889; Proc. U. S. Nat. Mus., vol. xvi, p. 268, pl. xxxvi, f. 10, 1893.

Trinity division: Glenrose, Texas.

Potomac formation: Near Telegraph Station, near Potomac Run, and Fredericksburg, Virginia.

Sphenolepidium virginicum Font. Potomac Fl., p. 259, pl. cxxv, f. 4; clxvi, f. 6, 1889.

Potomac formation: Near Brooke, Virginia.

Kootanie: Great Falls, Montana.

Sphenolepidium sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 90, f. (in text) 13, 1892.

Kootanie: Anthracite?, British Columbia.

SPHENOPTERIS Brongniart. Class. et Dist. Vég. Foss.: Mem. Mus. Hist. Nat., vol. viii, p. 233, 1822.

Sphenopteris acrodentata Font. Potomac Fl., p. 90, pl. xxxiv, f. 4, 1889.

Potomac formation: Dutch Gap Canal, Virginia; Baltimore, Maryland.

Sphenopteris corrugata Newby. Later Extinct Floras, p. 10, 1868.

Dakota group: Blackbird Hill, Nebraska.

Sphenopteris elongata Newby. Bost. Journ. Nat. Hist., vol. vii, p. 511, 1863.

———: Point Doughty, Orcas Island; Protection Island.

Sphenopteris eocenica Ett. = Dryopteris arguta.

Sphenopteris grevilicoides Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 34, pl. xi, f. 10, 11, 1874; Hollick, Bull. Geol. Soc. Am., vol. vii, p. 13, 1895.

Cretaceous: Marthas Vineyard.

Sphenopteris Lakesii Lx. = Dryopteris arguta.

Sphenopteris Guyottii Lx. Cret. and Tert. Fl., p. 137, pl. xxi, f. 1–7, 1883.

Green River group: Florissant, Colorado.

Sphenopteris latiloba Font. Potomac Fl., p. 90, pl. xxxv, f. 3–5; xxxvi, f. 4–9; xxxvii, f. 1, 1889.

Kootanie: Anthracite, British Columbia.

Potomac formation: Fredericksburg, near Dutch Gap Canal, Deep Bottom, and near Telegraph Station, Virginia.

Sphenopteris Mantelli Brongn.=Onychiopsis Mantelli.

Sphenopteris membranacea Lx. =Dryopteris arguta.

Sphenopteris nigricans Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 394, 1873 [1874]; Tert. Fl., p. 51, pl. ii, f. 4–5*a*, 1878.
Denver group: Golden, Colorado.
Laramie group: Black Buttes, Wyoming.

Sphenopteris pachyphylla Font. Potomac Fl., p. 93, pl. l, f. 5, 1889.
Potomac formation: Trents Reach, Virginia.

Sphenopteris spatulata Font. Potomac Fl., p. 93, pl. l, f. 4, 1889.
Potomac formation: Trents Reach, Virginia.

Sphenopteris thyrsopteroides Font. Potomac Fl., p. 89, pl. xxv, f. 3; lviii, f. 5, 1889.
Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia.

Sphenopteris valdensis? Heer. Fl. Foss. d. Portugal, p. 14, 1881; Font., Proc. U. S. Nat. Mus., vol. xvi, p. 263, pl. xxxvi, f. 2, 1893.
Trinity division: Glenrose, Texas.

SPHENOZAMITES Brongniart. Tableau Vég. Foss., p. 61 [110], 1849.

Sphenozamites sp., Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 7, 1885 [1886].
Kootanie: Martin Creek, British Columbia.

Spheria lapidea Lx.=Rossellinites lapideus.

Spheria myricæ Lx.=Sphærites myricæ.

Spheria rhytismoides Lx.=Sphærites Lesquereuxi.

SPIRÆA Linnæus. Syst. Nat., ed. i, 1735.

Spiræa Andersoni Heer. Fl. Foss. Alask., p. 39, pl. viii, f. 3, 1869.
Eocene?: Port Graham, Alaska.

SPIRAXIS Newberry. Ann. N. Y. Acad. Sci., vol. iii, p. 219, 1885.

Spiraxis bivalvis Ward. Bull. U. S. Geol. Surv., no. 37, p. 14, pl. i, f. 3, 1887.
Fort Union group: Clear Creek, Montana.

STAPHYLEA Linnæus. Sp. Pl., ed. i, p. 270, 1753.

Staphylea acuminata Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 415, 1873 [1874]; Tert. Fl., p. 267, pl. xlviii, f. 4, 5, 1878.
Green River group: Middle Park, Costellos Ranch, and Florissant, Colorado.

STENOPTERIS Saporta. Paléont. Française: Pl. Jur., vol. i, p. 290, 1870.

Stenopteris virginica Font. Potomac Fl., p. 112, pl. xxi, f. 8, 1889.
Potomac formation: Near Brooke, Virginia.

STERCULIA Linnæus. Diss. Dass., p. 29, 1747.

Sterculia aperta Lx. Cret. and Tert. Fl., p. 82, pl. x, f. 2, 3, 1883; Fl. Dak. Gr., p. 185, pl. xxii, f. 4, 1892.
Dakota group: Kansas.

Sterculia Drakei Cummins=Sterculia Snowii.

Sterculia elegans Font. Potomac Fl., p. 314, pl. clvii, f. 2; clviii, f. 2, 3, 1889.

Potomac formation: Deep Bottom, Virginia.

Sterculia labrusca Ung. Foss. Fl. v. Sotzka, p. 45, pl. xxviii, f. 1–11, 1850; Hollick, Bull. Geol. Soc. Am., vol. vii, p. 13, 1895.

Laurus labrusca Ung. Gen. et Sp. Pl. Foss., p. 423, 1850.

Cretaceous: Marthas Vineyard.

Sterculia Krejcii Vel. Fl. Böhm. Kried., Theil ii, p. 22, pl. v, f. 1, 1883; Hollick, Bull. Geol. Soc. Am., vol. vii, p. 13, 1895.

Cretaceous: Marthas Vineyard.

Sterculia lineariloba Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 358, 1874 [1876]. [Not afterwards referred to by Lesquereux.]

Dakota group: Clay Center, Kansas.

Sterculia lugubris Lx. Cret. and Tert. Fl., p. 81, pl. vi, f. 1–3, 1883.

Dakota group?: Near Golden, Colorado.

Sterculia modesta Sap. Lx.= Sterculia Saportanea.

Sterculia mucronata Lx. Fl. Dak. Gr., p. 182, pl. xxx, f. 1–4, 1892.

Dakota group: Kansas.

Sterculia obtusiloba Lx.= Sterculia tripartita.

Sterculia reticulata Lx. Fl. Dak. Gr., p. 185, pl. xxxiv, f. 10, 1892.

Dakota group: Kansas:

Sterculia rigida Lx. Cret. and Tert. Fl., p. 179, pl. xxxiv, f. 12, 1883.

Green River group: Florissant, Colorado.

Sterculia Snowii Lx. Fl. Dak. Gr., p. 183, pl. xxx, f. 5; pl. xxxi, f. 2, 3; pl. xxxii; pl. xxxiii, f. 1–4, 1892.

Sterculia Drakei Cum. Third Ann. Rept. Geol. Surv. Texas, 1891, p. 210, f. 8, 1892; Kn. in Hill, Am. Journ. Sci., vol. l, p. 213, 1895.

Dakota group: Kansas; Big Tucumcari Mountain, New Mexico.

Cheyenne sandstone: Belvidere, Kansas.

Sterculia Snowii disjuncta Lx. Fl. Dak. Gr., p. 184, p. lviii, f. 6, 1892.

Dakota group: Kansas.

Sterculia Saportanea nom. nov.

Sterculia modesta Sap. Lesquereux, Cret. and Tert. Fl., p. 125, pl. xx, f. 5, 1883. [S. modesta Sap., 1868, preoccupied by S. modesta Heer, 1853–1855.]

Denver beds: Golden, Colorado.

Sterculia tripartita [Lx.] n. comb.

Sterculia obtusiloba Lx. Cret. and Tert. Fl., p. 82, pl. viii, f. 3, 1883.

Aralia tripartita Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 248, pl. i, f. 1, 1874 [1876].

Dakota group: Kansas.

Sterculia vetustula Dn. Trans. Roy. Soc. Canada, vol. iii. sec. iv, p. 10, pl. iii, f. 2, 1885 [1886].

Intermediate series (Cretaceous): North Fork Old Man River, British Columbia.

Sterculia sp., Lx. Rept. on Clays in N. J., p. 28, 1878.

Amboy clay: Washington, New Jersey.

Sterculia sp., Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 133, pl. xiv, f. 4–7, 1897.
Clay marl (Upper Cretaceous): Ciffwood, New Jersey.

STROBILITES Lindley and Hutton. Foss. Fl. Gr. Brit., vol. ii, p. 23, pl. lxxxix, 1833–1835.

Strobilites inquirendus Hollick. Trans. N. Y. Acad. Sci., vol. xvi, p. 130, pl. xi, f. 1, 1897.
Clay marl (Upper Cretaceous): Cliffwood, New Jersey.

STYRAX (Tournefort) Linnæus. Syst., ed. i, 1735.

Styrax Ambra Ung. Syll. Pl. Foss., pt. iii, p. 34, pl. xxiv, f. 19, 20, 1865; Lx., Bull. Mus. Comp. Zoöl., vol. xvi, p. 51, 1888.
Denver group: Golden, Colorado.

Styrax laramiense Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 51, 1888.
Denver group: Golden, Colorado.

SYMPHOROCARPOPHYLLUM Dawson. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 29, 1886 [1887].

Symphorocarpophyllum albertum Dn. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 30, pl. ii, f. 17, 1886 [1887].
Canadian upper Laramie: Great Valley, British Columbia.

Symphorocarpophyllum linnæiforme Dn. Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 30, pl. ii, f. 18, 1886 [1887].
Canadian upper Laramie: Porcupine Creek.

TÆNIOPTERIS Brongniart. Prodr. Hist. Vég. Foss., p. 61, 1828.

Tæniopteris Gibbsii Newby. Bot. Journ. Nat. Hist., vol. vii, p. 512, 1863.
———: Point Doughty, Orcas Island.

Tæniopteris plumosa Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 24, pl. iv, f. 15, 1882 [1883].
Upper Cretaceous: Baynes Sound, Vancouver Island.

TAONURUS Fisher-Ooster. Die fossilen Fucoiden d. Schweizer-Alpen, p. 41, 1858.

Taonurus incertus Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 10, 1885 [1886].
Kootanie: British Columbia (no locality).

TAXITES Brongniart. Prodr. Hist. Vég. Foss., p. 108, 1828.

Taxites Langsdorfii Brgt. = Sequoia Langsdorfii.

Taxites Olriki Heer. Fl. Foss. Arct., vol. i, p. 95, pl. 1, f. 21–24; xlv, f. a, b, c, 1868; Lx, Cret. and Tert. Fl., p. 240, pl. l, f. 6, *6a*, 1883.
Miocene: Corral Hollow, California.
Eocene?: Port Graham, Alaska; Mackenzie River.
Canadian upper Laramie: Roche Percée, Souris River.

Taxites microphyllus Heer. Fl. Foss. Alask., p. 24, pl. i, f. 9, 9*b*, 1869.
Eocene?: Port Graham, Alaska.

Taxites sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]
Belly River series: South Saskatchewan.

Taxites sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 34, 1887. [Fossil wood.]
Upper Laramie group: Red Deer River; Wood End Depot, Canada.

Taxodites Europæus (Brongn.) Endl.=Glyptostrobus europæus.

TAXODIUM L. C. Richard. Ann. Mus. Paris, vol. xvi, p. 298, 1810.

Taxodium (Glyptostrobus) brookense Font.=Glyptostrobus brookense.

Taxodium brookense angustifolium Font.=Glyptostrobus brookense angustifolius.

Taxodium cuneatum Newby. Bost. Journ. Nat. Hist., vol. vii, p. 517, 1863; Dn., Trans. Roy. Soc. Canada, 1882, p. 25.
Upper Cretaceous: Nanaimo and Protection Island.
Kootanie series: British Columbia (no locality).

Taxodium (Glyptostrobus) denticulatum Font. Potomac Fl., p. 253, pl. cxxiv, f. 1, 1889.
Potomac formation: Kankeys, Virginia.

Taxodium distichum miocenum Heer. Mioc. Balt. Fl., p. 18, pl. ii; pl. iii, f. 6, 7, 1869.
Taxodium dubium (Sternb.) Heer. Fl. Tert. Helv., vol. i, p. 49, pl. xvii, f. 5-15, 1855; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 409, 1873 [1874].
Abies Nevadensis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 372, 1872 [1873].
Eocene: Elko Station, Nevada; Alaska?; Carbon?; Evanston.
Fort Union group: Montana.
Miocene: John Day Valley, Oregon.

Taxodium dubium (Sternb.) Heer. = Taxodium distichum miocenum.

Taxodium europæum Brongn. = Glyptostrobus europæus.

Taxodium (Glyptostrobus) expansum Font. Potomac Fl., p. 252, pl. cxxiii, f. 1, 1889.
Potomac formation: Near Telegraph Station, Virginia.

Taxodium (Glyptostrobus) fastigiatum Font. = Glyptostrobus fastigiatus.

Taxodium occidentale Newby. Bost. Journ. Nat. Hist., vol. vii, p. 516, 1863; Ill. Cret. and Tert. Pl., pl. xi, f. 1-3, 1878.
Fort Union group: Yellowstone River, Montana.
Upper Laramie group: Canada.

Taxodium (Glyptostrobus) ramosum Font. Potomac Fl., p. 251, pl. cxxiii, f. 2, 3; cxxiv, f. 2; cxxvii, f. 1; cxxxii, f. 1; clxvi, f. 1, 1889.
Potomac formation: Near Brooke, Virginia.
Kootanie: Great Falls, Montana.

Taxodium Tinajorum Heer. Fl. Foss. Alask., p. 22, pl. i, f. 1-5, 1869.
Eocene?: Port Graham, Alaska.

Taxodium Tinajorum? Heer, Lx. [Ann. Rept., 1871, p. 285] = Unknown. [Not afterwards recognized by Lesquereux.]

Taxodium (Glyptostrobus) virginicum Font. Potomac Fl., p. 252, pl. cxxi, f. 6, 1889.

Potomac formation: Near Potomac Run, Virginia.

Taxodium sp., Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 56, pl. vi, f. 10, 1893 [1894].

Upper Cretaceous: Nanaimo, Vancouver.

TAXOXYLUM Unger. Chlor. Prot., p. 33, 1842.

Taxoxylon sp., Dn. Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 331, 1875.

Lignitic tertiary: "Forty-ninth parallel."

Taxoxylon sp., Dn. Geol. Surv. Canada, Rept. of Progress for 1872–73, Appen. I, p. 67, 1873.

Lower Cretaceous: British Columbia.

TAXUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Taxus baccata L., Penhallow, 1890 = Taxus minor.

Taxus canadensis Willd., Penhallow (1896) = Taxus minor.

Taxus minor (Mx.) Britton.

Taxus baccata L. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 321, 333, 1890.

Taxus canadensis Willd. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 67, 73, 1896.

Pleistocene: Don River and Don Valley, Toronto; Cape Breton; Fort Madison, Iowa; Solsgirth and Rolling River, Manitoba; Bloomington, Illinois.

Terminalia Radobojensis Heer, Lesquereux [1871] = Magnolia Lesleyana.

Tetranthera Jacq. = Malapœnna.

Tetranthera præcursoria Lx. Cret. and Tert. Fl., p. 228, pl. xlviii, f. 2, 1883.

Fort Union group: Bad Lands, Dakota.

Tetranthera sessiliflora Lx. = Litsea sessiliflora and L. Weediana.

THINNFELDIA Ettingshausen. Abhandl. d. k. k. geol. Reichsanstalt, vol. i, abt. iii, no. 3, p. 2, 1852.

Thinnfeldia granulata Font. Potomac Fl., p. 111, pl. xxvi, f. 10–12; xxvii, f. 1–5, 8; pl. clxix, f. 1, 1889.

Potomac formation: Near Dutch Gap Canal and near Potomac Run, Virginia.

Thinnfeldia lanceolata Kn. Bull. U. S. Geol. Surv., no. 105, p. 49, pl. v, f. 5, 1893.

Laramie group: Bozeman coal field, Montana.

Thinnfeldia Lesquereuxiana Heer. = Thinnfeldia subintegrifolia.

Thinnfeldia montana nom. nov.

Thinnfeldia polymorpha* (Lx.) Kn. Proc. Biol. Soc. Wash., vol. vii, p. 153, 1892; Bull. U. S. Geol. Surv., no. 105, p. 47, pl. v [i], f. 1–4, 1893.

Salisburia polymorpha Lx. Am. Journ. Sci., 2d ser., vol. xxvii, p. 362, 1859 [nomen nudum]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 404, 1872 [1873].

[* Thinnfeldia polymorpha (Lx.) Kn., 1892, preoccupied by T. polymorpha Ett., 1860.]

Laramie and Livingston group: Bozeman coal field, Montana.

Thinnfeldia polymorpha (Lx.) Kn.=Thinnfeldia montana.

Thinnfeldia rotundiloba Font. Potomac Fl., p. 111, pl. xxvii, f. 6, 7, 1889.

Potomac formation: Fredericksburg and near Potomac Run, Virginia.

Thinnfeldia subintegrifolia (Lx.). n. comb.

Phyllocladus subintegrifolius Lx. Am. Journ. Sci., vol. xlvi, p. 92, 1868; Cret. Fl., p. 54, pl. i, f. 12, 1874; Fl. Dak. Gr., p. 34, pl. ii, f. 1–3, 1892.

Thinnfeldia Lesquereuxiana Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 37, pl. xliv, f. 9, 10; xlvi, f. 11, 12*a*, *b*; Hollick, Trans. N. Y. Acad. Sci., vol. xi, p. 99, pl. iii, f. 6, 1892; Newby, Fl. Amboy Clays, p. 59, pl. xi, f. 1–17, 1895 [1896].

Dakota group: Kansas; Decatur, Nebraska.

Amboy clay: Cretaceous; Atane, Greenland.

Thinnfeldia variabilis Font. Potomac Fl., p. 110, pl. xvii, f. 3–7; xviii, f. 1–6, 1889.

Potomac formation: Near Brooke and near Potomac Run, Virginia.

Knoxville beds: Tehama County, California.

THUITES Sternberg. Vers., vol. i, Fasc. iii, p. 39, 1823.

Thuites crassus Lx.=Brachyphyllum macrospermum.

Thuites (Chamæcyparis) alaskensis Lx. Proc. U. S. Nat. Mus., vol. v, p. 445, pl. vi, f. 7–9, 1882 [1883].

Eocene?: Unga Island, Alaska.

Thuites callitrina Ung. Chlor. Prot., p. 22, pl. vi, f. 2, 18; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 371, 1872 [1873]. [Not afterwards mentioned by Lesquereux.]

Green River group: Castello's Ranch, Colorado.

Thuites kurrianus Dunk.=Sphenolepidium kurrianum.

Thuites Meriani Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 73, pl. xvi, f. 17, 18, 1873; Newby., Fl. Amboy Clays, p. 54, pl. x, f. 5, 1896.

Amboy clay: No location.

THUJA Linnæus. Hort. Cliff., p. 449, 1737.

Thuja Garmani Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 372, 1872 [1873]; Cret. and Tert. Fl., p. 139, 1883 [1884].

Green River group: Elko Station, Nevada.

Thuja cretacea (Heer.) Newby. Fl. Amboy Clays, p. 53, pl. x, f. 1, 1*a*, 1895 [1896].

Libocedrus cretacea Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 49, pl. xxix, f. 1, 2; xliii, f. 1*d*, 1882.

Amboy clay: South Amboy, New Jersey.

Thuja interrupta Newby. Later Extinct Floras, p. 42, 1868; Dn., Trans. Roy. Soc. Canada, vol. iv, sec. iv, p. 22, pl. i, f. 3, 4, 1886 [1887].

Fort Union group: Porcupine Creek; Fort Union, North Dakota.

Thuja occidentalis L. Spec. Pl., p. 1002, 1753; Dn., Can. Nat., vol. ii, p. 422, 1857; Geol. Hist. Pl., p. 229, 1888; Britton, Trans. N. Y. Acad. Sci., vol. v, p. 218, 1886.

Post-Pliocene: Montreal, Canada.

Pleistocene: Cedar Creek and Natural Bridge, Virginia; Marietta, Ohio.

Thuja sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 34, 1887. [Fossil wood.]
Canadian upper Laramie: Four hundred mile Point, forty-ninth parallel; Middle Fork Old Man River.

Thuja sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]
Belly River series: Old Man River; Ribstone Creek; Twenty-Mile Creek.

Thuja sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 134, 1897.
Fort Union group: Lightning Creek, Converse County, Wyoming.

THYRSOPTERIS Kunze. Linnæa, vol. ix, p. 507, 1834.

Thyrsopteris alata Font. Potomac Fl., p. 124, pl. xxxvi, f. 3, 1889.
Potomac formation: Near Potomac Run, Virginia.

Thyrsopteris angustifolia Font. Potomac Fl., p. 131, pl. xliv, f. 4; xlv, f. 3; xlviii, f. 2; xlix, f. 3, 4; lv, f. 2; lviii, f. 8, 1889.
Potomac formation: Trents Reach, near Dutch Gap Canal, near Brooke, and near Potomac Run, Virginia.

Thyrsopteris angustiloba Font. Potomac Fl., p. 134, pl. xlviii, f. 3–5; lv, f. 3, 1889.
Potomac formation: Fredericksburg, near Dutch Gap Canal, Trents Reach, and White House Bluff, Virginia.

Thyrsopteris bella Font. Potomac Fl., p. 139, pl. liii, f. 5; lv, f. 6, 7; lvi, f. 2, 5; lvii, f. 1, 5; lviii, f. 4, 1889.
Potomac formation: Fredericksburg, Trents Reach, White House Bluff, and near Dutch Gap Canal, Virginia.

Thyrsopteris brevifolia Font. Potomac Fl., p. 121, pl. xxiv, f. 5, 10.
Potomac formation: Dutch Gap Canal, Virginia.
Kootanie: Great Falls, Montana.

Thyrsopteris brevipennis Font. Potomac Fl., p. 124, pl. xxxiv, f. 3; xxxvi, f. 2; xxxvii, f. 3, 9; xxxviii, f. 1; xli, f. 4, 1889.
Potomac formation: Dutch Gap Canal and Deep Bottom, Virginia; Baltimore, Maryland.
Kootanie: Great Falls, Montana.

Thyrsopteris crassinervis Font. Potomac Fl., p. 130, pl. xli, f. 1–3, 1889.
Potomac formation: Fredericksburg, Virginia.

Thyrsopteris crenata Font. Potomac Fl., p. 127, pl. xxxix, f. 1, 2, 1889.
Potomac formation: Fredericksburg, Virginia.

Thyrsopteris decurrens Font. Potomac Fl., p. 130, pl. xliii, f. 7; xlvi, f. 2, 4; xlix, f. 5–7, 1889.
Potomac formation: Dutch Gap Canal, Fredericksburg, near Brooke, near Potomac Run, Virginia.

Thyrsopteris densifolia Font. Potomac Fl., p. 129, pl. xxxix, f. 3; xl, f. 2–5; li, f. 5, 1889.
Potomac formation: Fredericksburg, and near Brooke, Virginia.

Thyrsopteris dentata Font. Potomac Fl., p. 121, pl. xxiv, f. 4, 6, 7, 9; xxv, f. 1, 2, 1889.

Potomac formation: Fredericksburg, Dutch Gap Canal, and near Potomac Run, Virginia.

Thyrsopteris distans Font. Potomac Fl., p. 134, pl. xlvii, f. 3; liv, f. 8, 1889.

Potomac formation: Near Brooke, Virginia.

Thyrsopteris divaricata Font. Potomac Fl., p. 125, pl. xxxvii, f. 5–8; clxx, f. 1, 1889.

Potomac formation: Fredericksburg and Dutch Gap Canal, Virginia.

Thyrsopteris elliptica Font. Potomac Fl., p. 133, pl. xxiv, f. 3; xlvi, f. 1; l, f. 6, 9; li, f. 4, 6, 7; liv, f. 6; lv, f. 4; lvi, f. 6, 7; lvii, f. 6; lviii, f. 2, 1889.

Potomac formation: Fredericksburg and Dutch Gap Canal, Virginia.

Thyrsopteris heteroloba Font. Potomac Fl., p. 139, pl. liii, f. 4, 1889.

Potomac formation: Fredericksburg, Virginia.

Thyrsopteris heteromorpha Font. Potomac Fl., p. 136, pl. lii, f. 1, 1889.

Potomac formation: Fredericksburg, Virginia.

Thyrsopteris heterophylla Font. Potomac Fl., p. 142, pl. lviii, f. 3, 1889.

Potomac formation: Fredericksburg, Virginia.

Thyrsopteris inæquipinnata Font. Potomac Fl., p. 142, pl. lvii, f. 3, 8, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

Thyrsopteris insignis Font. Potomac. Fl., p. 127, pl. xxxix, f. 4; xl, f. 1; xli, f. 6; xlii, f. 1, 2, 4; xliii, f. 1, 3, 1889.

Potomac formation: Fredericksburg and near Potomac Run, Virginia.

Kootanie: Great Falls, Montana.

Thyrsopteris insignis angustipennis Font. Potomac Fl., p. 128, pl. xlii, f. 3; xliii, f. 2, 1889.

Potomac formation: Fredericksburg, Virginia.

Thyrsopteris Meekiana Font. Potomac Fl., p. 125, pl. xxxviii, f. 2–4, 8; l, f. 7, 8; li, f. 3, 1889.

Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia; Baltimore, Maryland.

Thyrsopteris Meekiana angustiloba Font. Potomac Fl., p. 126, pl. xxxviii, f. 5–7, 9; xliii, f. 8; xliv, f. 3; xlvii, f. 4; xlviii, f. 1; liv, f. 2, 11; lv. f. 1; lvi, f. 1, 3, 1889.

Potomac formation: Baltimore, Maryland; near Dutch Gap Canal, near Brooke, and Fredericksburg, Virginia.

Thyrsopteris microloba Font. Potomac Fl., p. 140, pl. lvii, f. 4, 1889.

Potomac formation: Near Dutch Gap Canal, Virginia.

Thyrsopteris microloba alata Font. Potomac Fl., p. 140, pl, lv, f. 5; lviii, f. 1, 1889.
Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia.
Kootanie: Great Falls, Montana.

Thyrsopteris microphylla Font. Potomac Fl., p. 131, pl. xlv, f. 1, 2, 4, 5, 1889.
Potomac formation: Fredericksburg and near Potomac Run, Virginia.

Thyrsopteris nana Font. Potomac Fl., p. 141, pl. lvi, f. 4, 8, 1889.
Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia.

Thyrsopteris nervosa Font. Potomac Fl., p. 122, pl. xxv, f. 4, 5, 16; xxxvii, f. 2, 4; xxxix, f. 5; xl, f. 6, 1889.
Potomac formation: Fredericksburg and near Potomac Run, Virginia.

Thyrsopteris obtusiloba Font. Potomac Fl., p. 143, pl. lviii, f. 7, 10, 1889.
Potomac formation: Dutch Gap Canal and near Potomac Run, Virginia.

Thyrsopteris pachyphylla Font. Potomac Fl., p. 135, pl. l, f. 3, 1889.
Potomac formation: Near Potomac Run, Virginia.

Thyrsopteris pachyrachis Font. Potomac Fl., p. 132, pl. xlvi, f. 3, 5; xlvii, f. 1, 2; xlix, f. 1, 1889.
Potomac formation: Fredericksburg, near Potomac Run, and near Dutch Gap Canal, Virginia.

Thyrsopteris pecopteroides Font. Potomac Fl., p. 135, pl. li, f. 1, 1889.
Potomac formation: Fredericksburg, Virginia.

Thyrsopteris pinnatifida Font. Potomac Fl., p. 136, pl. li, f. 2; liv, f. 4, 5, 7; lvii, f. 7, 1889.
Potomac formation: Fredericksburg, Virginia.

Thyrsopteris rarinervis Font. Potomac Fl., p. 123, pl. xxvi, f. 6, 7; xliii, f. 4–6; xliv, f. 1, 2, 5; xlix, f. 2; clxix, f. 6, 7, 1889.
Potomac formation: Fredericksburg, near Brooke, White House Bluff, and Trents Reach, Virginia.
Knoxville beds: Tehama County, California.
Kootanie: Great Falls, Montana.

Thyrsopteris retusa Font. Potomac Fl., p. 144, pl. lix, f. 10, 1889.
Potomac formation: Near Potomac Run, Virginia.

Thyrsopteris rhombifolia Font. Potomac Fl., p. 138, pl. lii, f. 5; liv, f. 1, 1889.
Potomac formation: Fredericksburg and near Dutch Gap Canal, Virginia.

Thyrsopteris rhombiloba Font. Potomac Fl., p. 144, pl. lix, f. 7; lx, f. 8, 1889.
Potomac formation: Near Potomac Run, Virginia.

Thyrsopteris sphenopteroides Font. Potomac Fl., p. 143, pl. lviii, f. 6, 1889.

Potomac formation: Near Potomac Run, Virginia.

Thyrsopteris squarrosa Font. Potomac Fl., p. 143, pl. lix, f. 3, 1889.

Potomac formation: Near Potomac Run and Telegraph Station, Virginia.

Thyrsopteris varians Font. Potomac Fl., p. 137, pl. lii, f. 2–4; liii, f. 1–3; liv, f. 10; lvii, f. 2, 1889.

Potomac formation: Fredericksburg, Virginia.

Thyrsopteris virginica Font. Potomac Fl., p. 120, pl. xxiv, f. 1, 1889.

Potomac formation: Near Potomac Run, Virginia.

TILIA (Tournefort) Linnæus. Syst., ed. i, 1735.

Tilia alaskana Heer. Fl. Foss. Alask., p. 36, pl. x, f. 2, 3, 1869.

Eocene? : Port Graham, Alaska.

Tilia antiqua Newby.=Viburnum antiquum.

Tilia populifolia Lx. Cret. and Tert. Fl., p. 179, pl. xxxiv, f. 8, 9, 1883.

Green River group: Florissant, Colorado.

TILIÆPHYLLUM Newberry. Fl. Amboy Clays, p. 109, 1896.

Teliæphyllum dubium Newby. Fl. Amboy Clays, p. 109, pl. xv, f. 5, 1895 [1896].

Amboy clay: Fish House.

TMESIPTERIS Bernhardi. In Schrad. Journ., vol. ii, p. 131, 1800.

Tmesipteris Alleni (Lx.) Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 256, pl. ccv, f. 12, 1894.

Salvinia Alleni Lx. Tert. Fl., p. 65, pl. v, f. 11, 1878.

Ophioglossum Alleni Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 371, 1872 [1873].

Green River group: South Park, Colorado.

Todia? Saportanea Lx. = Lomatia? Saportanea.

Torreya Arnott, 1838 = Tumion Rafinesque, 1840.

Torreya densifolia Dn. = Tumion densifolium.

Torreya dicksonioides Dnl = Tumion dicksonioides.

Torreya falcata Font. = Tumion falcatum.

Torreya oblanceolata Lx. = Tumion oblanceolatum.

Torreya virginica Font. = Tumion virginicum.

TOXYLON Rafinesque. In Am. Month. Mag., vol. ii, p. 18, 1817.

Toxylon pomiferum Raf.

Maclura auriantiaca Nutt. Penhallow in Coleman, Journ. Geol., vol. iii, p. 635, 1895; Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 69, 72, 1896.

Pleistocene: Don River, Canada.

TRAPA Linnæus. Gen. Pl., ed. i, p. 359, 1737.

Trapa americana Kn. Eighteenth Ann. Rept. U. S. Geol. Surv., pt. iii, p. 733, pl. cii, f. 7*a*, 1898.

Payette formation: Idaho City, Idaho.

Trapa borealis Heer. Fl. Foss. Alask., p. 38, pl. viii, f. 9–14, 1869; Dn., Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 330, pl. xvi, f. 10, 1875.

Belly River series: Vermilion River.
Eocene?: Port Graham, Alaska.
Lower Laramie group: Red Deer and Rosebud rivers, Canada.

Trapa? microphylla Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 369, 1875 [1876]; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. p. 304, 1874 [1876]; Lx., Tert. Fl., p. 295, pl. lxi, f. 16–17*a*, 1878; Ward, Bull. U. S. Geol. Surv., no. 37, p. 64, pl. xxviii, f. 2–5, 1887.

?**Neuropteris angulata** Newby. Rept. Colo. River of the West, by Ives, p. 131, pl. iii, f. 5, 1861.

Upper Laramie group: Great Valley.
Fort Union group: Burns's Ranch, Montana.
Laramie group: Converse County, Wyoming.
Montana group: Point of Rocks, Wyoming.
Lower Laramie group: Bad Lands, Red Deer and Rosebud rivers, and Pincher Creek, Canada.

Trapa? occidentalis Kn. Eighteenth Ann. Rept. U. S. Geol. Surv. pt. iii, p. 734, pl. cii, f. 7*b*, 1898.

Payette formation: Idaho City, Idaho.

Trapa sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 142, 1897.

Laramie group?: "Dutton Creek coal," Wyoming.

TRICALYCITES Newberry. Fl. Amboy Clays, p. 132, 1895 [1896.]

Tricalycites papyraceus Newby. Fl. Amboy Clays, p. 132, pl. xlvi, f. 30–38, 1895 [1896]; Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 63, pl. clxxx, f. 8, 1894.

Cretaceous: Long Island.
Amboy clay: Woodbridge, New Jersey.

TRICARPELLITES Bowerbank. Hist. Foss. Fruits and Seeds, London Clay, p. 76, 1840.

Tricarpellites striatus Newby. Fl. Amboy Clays, p. 132, pl. xlvi, f. 9–13, 1895 [1896].

Amboy clay: Woodbridge, New Jersey.

Trunk No. 1 Font. Potomac Fl., p. 189, pl. clxxiv–clxxviii, 1889.

Potomac formation.

Trunk No. 2 Font. Potomac Fl., p. 191, pl. clxxix, clxxx, 1889.

Potomac formation: Maryland.

TSUGA Carrier. Trait. Conif., p. 185, 1855.

Tsuga Mertensiana (Bongn.) Carr. Kn., Jour. Geol., vol. iii, p. 531, 1895.

Interglacial: Muir Glacier, Alaska.

TUMION Rafinesque. Amen. Nat., p. 63, 1840.

Tumion densifolium (Dn.) n. comb.

Torreia densifolia Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 25; pl. v, f. 20, 20*a*, 1882 [1883].

Upper Cretaceous: Protection Island.

Tumion dicksonioides (Dn.) n. comb.

Torreia dicksonioides Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 21, pl. ii, f. 4, 1882 [1883].

———: Pine River, Northwest Territory.

Tumion falcatum (Font.) n. comb.

Torreya falcata Font. Potomac Fl., p. 235, pl. cxiii, f. 4, 1889.

Potomac formation: Near Potomac Run, Virginia.

Tumion oblanceolatum (Lx.) n. comb.

Torreya oblanceolata Lx. Cret. and Tert. Fl., p. 30, pl. i, f. 2, 1883.

Dakota group?: Near Golden, Colorado.

Tumion virginicum (Font.) n. comb.

Torreya virginica Font. Potomac Fl., p. 234, pl. cix, f. 8, 1889.

Potomac formation: Near Brooke, Virginia.

TYPHA Linnæus. Syst., ed. i, 1735.

Typha latifolia? L. Penhallow, Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 64, 73, 1896.

Pleistocene: Besserers Wharf, Ottawa River.

Typha latissima Al. Br. in Stizenberger. Versteinerungen, p. 75; Lx., Cret. and Tert. Fl., p. 141, pl. xxiii, f. 4, 4*a*, 1883.

Green River group: Uinta County, formerly but incorrectly called, Randolph County, Wyoming.

TYSONIA Fontaine. Potomac Fl., p. 186, 1889.

Tysonia marylandica Font. = Cycadeoidea marylandica.

Ulmania Newby. = Ullmannia.

ULLMANNIA Göppert. Monogr. Foss. Conif., p. 185, 1850.

Ullmannia sp. (Newby).

Ulmania sp., Newby. Proc. Lyc. Nat. Hist. N. Y., 2d ser., Jan. 3 to Mar. 3, 1873, p. 10, 1873.

Cretaceous: Keyport, New Jersey.

Ulmiphyllum Font. (1889) = Ulmophyllum Ett. (1883).

Ulmiphyllum brookense Font. = Ulmophyllum brookense.

Ulmiphyllum crassinerve Font. = Ulmophyllum crassinerve.

Ulmiphyllum tenuinerve Font. = Ulmophyllum tenuinerve.

ULMITES Dawson. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 88, 1890.

Ulmites pusillus Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 88, f. (in text) 24, 1890.

Eocene?: North Similkameen River, British Columbia.

ULMOPHYLLUM Ettingshausen. Tert. Fl. Austr.: Denkschr. Wien. Akad., vol. xlvii, abt. i, p. 26, 1883.

Ulmophyllum brookense (Font.).

Ulmiphyllum brookense Font. Potomac Fl., p. 312, pl. clv, f. 8; clxiii, f. 7, 1889.

Potomac formation: Near Brooke, Virginia.

Ulmophyllum crassinerve (Font.)

Ulmiphyllum crassinerve Font., Potomac Fl., p. 313, pl. clviii, f. 6, 7, 1889.

Potomac formation: Deep Bottom, Virginia.

Ulmophyllum priscum Dn. Trans. Roy. Soc. Canada, vol. xi, sec. iv, p. 59, pl. viii, f. 28, 1893 [1894].

Upper Cretaceous: Port McNeill, Vancouver Island.

Ulmophyllum tenuinerve (Font.)

Ulmiphyllum tenuinerve Font. Potomac Fl., p. 313, pl. clviii, f. 1, 1889.

Potomac formation: Near Brooke, Virginia.

ULMUS (Tournefort) Linnæus. Syst., ed. i, 1735.

Ulmus affinis Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 16, pl. iv, f. 4, 5, 1878.

Miocene: Table Mountain, California.

Ulmus alata? Michx. Lx., Am. Journ. Sci., vol. xxvii, p. 365, 1859.

Pleistocene: Banks of Mississippi, near Columbus, Kentucky.

Ulmus americana L. Hollick, Bull. Torr. Bot. Club, vol. xix, p. 332, 1892; Penhallow in Coleman, Journ. Geol., vol. iii, p. 635, 1895; Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 68, 73, 1896.

Miocene?: Bridgeton, New Jersey.

Pleistocene: Don River, Canada.

Ulmus antecedens Lx. Bull. Mus. Comp. Zoöl., vol. xvi, p. 49, 1888.

Denver group: Golden, Colorado.

Ulmus Braunii Heer. Fl. Tert. Helv., vol. ii, p. 59, pl. lxxix, f. 14–21, 1856; Lx., Cret. and Tert. Fl., p. 161, pl. xxvii, f. 1–4, 8, 1883.

Green River group: Florissant, Colorado.

Eocene?: Kamloops, British Columbia.

Ulmus Brownellii Lx. Cret. and Tert. Fl., p. 160, pl. xxviii, f. 2, 4, 1883.

Green River group: Florissant, Colorado, White River.

Ulmus californica Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 15, pl. iv, f. 1, 2; pl. vi, f. 7*a*, 1878; Cret. and Tert. Fl., p. 265, pl. xlvB, f. 3, 4, 7, 1883.

Miocene: Chalk Bluffs and Table Mountain, California.

Miocene: John Day Valley, Oregon.

Ulmus dubia Dn. Trans. Roy. Soc. Canada, vol. i, sec. iv, p. 27, pl. vii, f. 29, 1882 [1883].

Upper Cretaceous: Baynes Sound.

Ulmus grandifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 508, 1882 [1883].

Tertiary: Tongue River, Wyoming.

Ulmus Hilliæ Lx. Cret. and Tert. Fl., p. 160, pl. xxviii, f. 1, 3, 1883.
Green River group: Florissant, Colorado.

Ulmus? irregularis Lx. = Ficus irregularis.

Ulmus minima Ward. Bull. U. S. Geol. Surv., no. 37, p. 45, pl. xxiii, f. 3, 4, 1887.
Fort Union group: Clear Creek, Montana.

Ulmus orbicularis Ward. Bull. U. S. Geol. Surv., no. 37, p. 46, pl. xxiii, f. 6, 1887.
Fort Union group: Clear Creek, Montana.

Ulmus planeroides Ward. Bull. U. S. Geol. Surv., no. 37, p. 44, pl. xxiii, f. 1, 2, 1887.
Fort Union group: Clear Creek, Montana.

Ulmus præcursor Dn. Trans. Roy. Soc. Canada, vol. iv. sec. iv, p. 28, pl. ii, f. 11, 1886 [1887].
Upper Laramie group: Canada (exact locality not given).

Ulmus plurinervia Ung. Chlor. Prot., p. 95, pl. xxv, f. 1-4, 1847; Heer, Fl. Foss. Alask., p. 34, pl. v, f. 1, 1869.
Eocene?: Port Graham, Alaska.
Miocene: John Day Valley, Oregon.

Ulmus pseudo-americana Lx. Cret. and Tert. Fl., p. 249, pl. liv, f. 10, 1883.
Miocene: Bridge Creek and John Day Valley, Oregon.

Ulmus pseudo-fulva Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 16, pl. iv, f. 3, 1878.
Miocene: Chalk Bluffs, California.

Ulmus quercifolia Ung. Chlor. Prot., p. 96, pl. xxv, f. 5, 1847; Lx., Bull. Mus. Comp. Zoöl., vol. xvi, p. 49, 1888.
Denver group: Golden, Colorado.

Ulmus racemosa Thomas. Penhallow, Bull. Geol. Soc. Am., vol. i, p. 323, 1890; Kn., Am. Geol., vol. xviii, p. 371, 1896.
Pleistocene: Don River, Toronto.
Glacial: Morgantown, West Virginia.

Ulmus rhamnifolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 45, pl. xxiii, f. 5, 1887.
Fort Union group: Clear Creek, Montana.

Ulmus sorbifolia Göpp. Zeitschr. Deutsch. geol. Gesell., vol. iv, p. 492, 1852; Lx., Proc. U. S. Nat. Mus., vol. v, p. 447, 1882.
Eocene?: Cook Inlet, Alaska.

Ulmus speciosa Newby. Proc. U. S. Nat. Mus., vol. v, p. 507, 1882 [1883].
Miocene?: Bridge Creek, Oregon.

Ulmus tenuinervis Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 412, 1873 [1874]; Tert. Fl., p. 188, pl. xxvi, f. 1-3, 1878.
Green River group: Florissant, Colorado.

Ulmus sp., Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 33, 1887. [Wood.]
Fort Pierre series: Head of Swift Current.

Undetermined fern Font. Potomac Fl., p. 119, pl. xxi, f. 12, 1889.
Potomac formation: Near Dutch Gap Canal, Virginia.

Undetermined fern in circinate vernation sp., Font. Potomac Fl., p. 145, pl. lix, f. 5, 1889.
Potomac formation: Near Potomac Run, Virginia.

Undetermined plant (*a*) Font. Potomac Fl., p. 274, pl. cxxxvi, f. 13, 1889.
Potomac formation: Fredericksburg, Virginia.

Undetermined plant (*b*) Font. Potomac Fl., p. 274, pl. cxxxvi, f. 14, 1889.
Potomac formation: Fredericksburg, Virginia.

Undetermined plant (*c*) Font. Potomac Fl., p. 275, pl. cxxxvii, f. 1, 1889.
Potomac formation: Fredericksburg, Virginia.

Undetermined plant (*d*) Font. Potomac Fl., p. 275, pl. cxxxvii, f. 2, 3, 1889.
Potomac formation: Fredericksburg, Virginia.

Undetermined plant (*e*) Font. Potomac Fl., p. 275, pl. cxxxvii, f. 4, 1889.
Potomac formation: Fredericksburg, Virginia.

Undetermined plant (*f*) Font. Potomac Fl., p. 275, pl. cxxxvii, f. 5, 1889.
Potomac formation: Fredericksburg, Virginia.

Undetermined plant (*g*) Font. Potomac Fl., p. 275, pl. clxix, f. 4, 5, 1889.
Potomac formation: Baltimore, Maryland.

Undetermined plant (*h*) Font. Potomac Fl., p. 276, pl. clxix, f. 9, 1889.
Potomac formation: Baltimore, Maryland.

Undetermined plant (*i*) Font. Potomac Fl., p. 276, pl. clxxiii, f. 11, 1889.
Potomac formation: Baltimore, Maryland.

VACCINOPHYLLUM Dawson. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 88, 1890.

Vaccinophyllum quæstum Dn. Trans. Roy. Soc. Canada, vol. viii, sec. iv, p. 88, f. (in text) 23, 1890.
Eocene?: Similkameen River, British Columbia.

VACCINIUM Linnæus. Syst., ed. i, 1735.

Vaccinium coloradense Lx. Proc. U. S. Nat Mus., vol. x, p. 42, pl. iii, f. 4, 5, 1887.
Denver group: Silver Cliff, Colorado.

Vaccinium Friesii Heer. Fl. Foss. Alask., p. 35, pl. viii, f. 4, 1869.
Eocene?: Port Graham, Alaska.

Vaccinium reticulatum Al. Br. in Stizenberger. Verzeichniss, p. 82, 1851; Lx., Tert. Fl., p. 235, pl. lix, f. 6, 1878.
Eocene?: Cook Inlet, Alaska.
Green River group: Florissant, Colorado.

Vaccinium uliginosum L. Macoun in Coleman Journ. Geol., vol. iii, p. 626, 1895.
Pleistocene: Scarboro Heights, Ontario.

VALLISNERIA Michaux. Ex Linnæus, Gen. Pl., ed. i, p. 300, 1737.
Vallisneria sp., Penhallow. Bull. Geol. Soc. Am., vol. i, p. 325, 1890; Trans. Roy. Soc. Canada, 2d ser., vol. ii, sec. iv, p. 64, 73, 1896.
Pleistocene: Rolling River, Manitoba; Besserers Wharf, Ottawa River.

VIBURNITES Lesquereux. Fl. Dak. Gr., p. 124, 1892.
Viburnites crassus Lx. Fl. Dak. Gr., p. 124, pl. xlv, f. 1–4, 1892.
Dakota group: Kansas.
Viburnites Evansanus Ward. Journ. Geol., vol. ii, p. 261, 262, 1894.
Dakota group: Black Hills, South Dakota.
Viburnites Masoni Lx. Fl. Dak. Gr., p. 125, pl. xlv, f. 5, 1892.
Dakota group: Kansas.

VIBURNUM Linnæus. Syst., ed. i, 1735.
Viburnum anceps Lx. = Platanus rhomboidea.
Viburnum antiquum (Newby.) Hollick. MSS.
Viburnum tilioides Ward. Bull. U. S. Geol. Surv., no. 37, p. 107, pl. l, f. 1–3; pl. li, f. 1–8; pl. lii, f. 1, 2, 1887.
Tilia antiqua Newby. Later Extinct Floras, p. 52, 1868.
Fort Union group: Clear Creek, Montana.
Denver group: Golden, Colorado.
Viburnum asperum Newby. Later Extinct Floras, p. 54, 1868.
Fort Union group: Cracker Box and Seven-Mile creeks, Montana; Bad Lands, Dakota.
Canadian Upper Laramie: North Saskatchewan; Souris River.
Viburnum betulæfolia Ward. Bull. U. S. Geol. Surv., no. 37, p. 114, pl. lvii, f. 4, 1887.
Fort Union group: Burns's Ranch, Montana.
Viburnum bridgetonense Britton in Hollick. Bull. Torr. Bot. Club, vol. xix, p. 331, 1892.
Miocene?: Bridgeton, New Jersey.
Viburnum calgarianum Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 18, 1885 [1886]; op. cit., vol. iv, p. 29, pl. ii, f. 14, 1886 [1887].
Canadian upper Laramie: Calgary, Canada; Shaganappi Point.
Viburnum contortum Lx. Ann. Rept. U. S. Geol. and Geogr. Surv., p. 396, 1872 [1873]. [Not afterwards recognized by its author.]
Laramie group?: Black Buttes, Wyoming.
Viburnum cuneatum Newby. Proc. U. S. Nat. Mus., vol. v, p. 511, 1882 [1883].
Tertiary: Tongue River, Wyoming.
Viburnum dakotense Lx. Cret. and Tert. Fl., p. 231, pl. xlviA, f. 9, 1883.
Fort Union group: Bad Lands, North Dakota.

Viburnum Dentoni Lx. Cret. and Tert. Fl., p. 231, pl. xlix, f. 2, 3, 1883.

Fort Union group: Bad Lands, North Dakota?

Viburnum dichotomum Lx. Ann. Rept., op. cit., p. 399, 1872 [1873]; Tert. Fl., p. 225, pl. xxxviii, f. 6, 1878.

Viburnum rotundifolium Lx. Ann. Rept., op. cit., p. 305, 1874 [1876]; Tert. Fl., p. 225, pl. xxxvii, f. 12; pl. xxxviii, f. 10; pl. lxi, f. 22, 1878.

Viburnum Whymperi Heer. Lx., Ann. Rept., op. cit., p. 395, 1872 [1873]; Tert. Fl., p. 225, pl. xxxviii, f. 7; pl. lxi, f. 23, 1878.

Laramie group: Black Buttes and Point of Rocks, Wyoming.

Viburnum ellsworthianum Lx. Fl. Dak. Gr., p. 121, pl. xxi, f. 6, 1892.

Dakota group: Kansas.

Viburnum elongatum Ward. Bull. U. S. Geol. Surv., no. 37, p. 112, pl. liv, f. 4, 5, 1887.

Fort Union group: Clear Creek, Montana.

Viburnum erectum Ward. Bull. U. S. Geol. Surv., no. 37, p. 112, pl. lv, f. 3, 1887.

Fort Union group: Clear Creek, Montana.

Viburnum finale Ward. Bull. U. S. Geol. Surv., no. 37, p. 115, pl. lvii, f. 5, 1887.

Fort Union group: Iron Bluff, Montana.

Viburnum goldianum Lx. Tert. Fl., p. 227, pl. lx, f. 2-2*c*, 1878.

Denver group: Golden, Colorado.

Viburnum grandedentatum Newby. Proc. U. S. Nat. Mus., vol. v, p. 511, 1882 [1883].

Tertiary: Tongue River, Wyoming.

Viburnum grewiopsidium Lx. Fl. Dak. Gr., p. 120, pl. xxi, f. 4, 1892.

Dakota group: Kansas.

Viburnum inæquilaterale Lx. Fl. Dak. Gr., p. 119, pl. xxi, f. 2, 3, 1892.

Dakota group, Kansas.

Viburnum integrifolium Newby. MSS. Hollick, Bull. Torr. Bot. Club, vol. xxi, p. 54, pl. clxxvii, f. 7, 1894; Newby., Fl. Amboy Clays, p. 125, pl. xli, f. 1, 1895 [1896].

Cretaceous: Glen Cove, Long Island.

Amboy clay: Woodbridge, New Jersey.

Viburnum Lakesii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 401, 1873 [1874]; Tert. Fl., p. 226, pl. xxxvii, f. 13, 1878.

Denver group: Golden, Colorado.

———?: Northwest Territory.

Viburnum lanceolatum Newby. Later Extinct Floras, p. 54, 1868.

Fort Union group: Fort Union, North Dakota.

Upper Laramie group: Porcupine Creek.

Viburnum Lesquereuxii Ward in Lx. Fl. Dak. Gr., p. 121, 1892.

Dakota group: Kansas.

Viburnum Lesquereuxii commune Lx. Fl. Dak. Gr., p. 122, pl. liii, f. 2, 1892.
Dakota group: Kansas.

Viburnum Lesquereuxii cordifolium Lx. Fl. Dak. Gr., p. 122, pl. lii, f. 9, 1892.
Dakota group: Kansas.

Viburnum Lesquereuxii lanceolatum Lx. Fl. Dak. Gr., p. 123, pl. liii, f. 3, 1892.
Dakota group: Kansas.

Viburnum Lesquereuxii latus Lx. Fl. Dak. Gr., p. 123, pl. lii, f. 10, 1892.
Dakota group: Kansas.

Viburnum Lesquereuxii longifolium Lx. Fl. Dak. Gr., p. 122, pl. liii, f. 1, 1892.
Dakota group: Kansas.

Viburnum Lesquereuxii rotundifolium Lx. Fl. Dak. Gr., p. 122, pl. lii, f. 8, 1892.
Dakota group: Kansas.

Viburnum? Lesquereuxii tenuifolium Lx. Fl. Dak. Gr., p. 123, pl. lxiv, f. 13, 1892.
Dakota group: Kansas.

Viburnum limpidum Ward. Bull. U. S. Geol. Surv., no. 37, p. 110, pl. liii, f. 3-6, 1887.
Fort Union group: Clear Creek, Montana.

Viburnum macrodontum Ward. Bull. U. S. Geol. Surv., no. 37, p. 110, pl. liii, f. 2, 1887.
Fort Union group: Clear Creek, Montana.

Viburnum marginatum Lx. = Platanus marginata.

Vibernum Newberrianum Ward. Bull. U. S. Geol. Surv., no. 37, p. 113, pl. lv, f. 4-9, 1887.
Fort Union group: Cracker Box Creek, Montana.

Viburnum Nordenskiöldi Heer. Fl. Foss. Alask., p. 36, pl. iii, f. 13, 1869.
Eocene?: Neniltschik, Alaska.
Fort Union group: Clear Creek, Montana; Little Missouri, Gladstone, and Bad Lands, North Dakota.

Viburnum oppositinerve Ward. Bull. U. S. Geol. Surv., no. 37, p. 112, pl. lv, f. 1, 2, 1887.
Fort Union group: Clear Creek, Montana.

Viburnum oxycoccoides Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 17, 1885 [1886]; op. cit., vol. iv, p. 29, pl. ii, f. 15, 1886 [1887].
Upper Laramie group: Calgary, Shaganappi Point, Canada.

Viburnum paucidentatum Newby. Proc. U. S. Nat. Mus., vol. v, p. 511, 1882 [1883].
Tertiary: Tongue River, Wyoming.

Viburnum perfectum Ward. Bull. U. S. Geol. Surv., no. 37, p. 109, pl. lii, f. 3, 4; pl. liii, f. 1, 1887.
Fort Union group: Clear Creek, Montana.

Viburnum perplexum Ward. Bull. U. S. Geol. Surv., no. 37, p. 111, pl. liv, f. 1, 1887.
Fort Union group: Clear Creek, Montana.

Viburnum platanoides Lx.=Platanus platanoides.

Viburnum pubescens Pursh. Dn., Rept. on Geol. and Res. near 49th Parallel, Appen. A, p. 330, 1875.
———: Porcupine Creek.

Viburnum robustum Lx. Fl. Dak. Gr., p. 120, pl. xx, f. 4–6, 1892.
Dakota group: Kansas.

Viburnum rotundifolium Lx.=Viburnum dichotomum.

Viburnum saskatchuense Dn. Trans. Roy. Soc. Canada, vol. v, sec. iv, p. 35, 1887 [1888].
Canadian upper Laramie: North Saskatchewan.

Viburnum solitarium Lx. Tert. Fl., p. 227, pl. lx, f. 3, 1878.
Denver group: Golden, Colorado.

Viburnum sphenophyllum Kn. in Lx. Fl. Dak. Gr., p. 123, pl. liii, f. 4, 1892.
Dakota group: Kansas.

Viburnum tilioides Ward=Viburnum antiquum.

Viburnum Whymperi Heer. Fl. Foss. Arct., vol. ii, abt. iv, p. 475, pl. xlvi, f. 1*b*, 1869; Lx., Tert. Fl., p. 225, pl. xxxviii, f. 7; lxi, f. 23, 1878.
Fort Union group: Clear Creek, Montana.
Miocene: Shasta County, California.

Viburnum sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 134.
Fort Union group: Lightning Creek, Converse County, Wyoming.

VITIPHYLLUM Fontaine. Potomac Fl., p. 308, 1889.

Vitiphyllum crassifolium Font. Potomac Fl., p. 308, pl. cl, f. 9, 10, 1889.
Potomac formation: Potomac Run, Virginia.

Vitiphyllum multifidum Font. Potomac Fl., p. 309, pl. clxxiii, f. 1–9, 1889.
Potomac formation: Baltimore, Maryland.

Vitiphyllum parvifolium Font. Potomac Fl.. p. 309, pl. clxxii, f. 11, 12, 1889.
Potomac formation: Baltimore, Maryland.

VITIS (Tournefort) Linnæus. Syst., ed. i, 1735.

Vitis Bruneri Ward. Bull. U. S. Geol. Surv., no. 37, p. 69, pl. xxxii, f. 1, 2, 1887.
Vitis carbonensis Ward. Loc. cit., p. 70, pl. xxxii, f. 3.
Laramie group: Carbon, Wyoming.

Vitis crenata Heer. Fl. Foss. Alask., p. 36, pl. viii, f. 6, 1869.
Eocene?: Port Graham, Alaska.

Vitis cuspidata Ward. Bull. U. S. Geol. Surv., no. 37, p. 71 pl. xxxii, f. 6–8, 1887.
Fort Union group: Burns's Ranch and Seven-Mile Creek, Montana.

Vitis islandica (?) Heer. Fl. Foss. Arct., vol. i, p. 150, pl. xxvi, f. 1*e*, *f*, 7*a*; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 10, 1871 [1872]. [Not afterwards referred to by Lesquereux.]
Montana group?: Point of Rocks, Wyoming.

Vitis Olriki Heer. Fl. Foss. Arct., vol. i, p. 120, p . xlviii, f. 1, 1868; Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 12, 1871 [1872]; Tert. Fl., p. 241, pl. xli, f. 8, 1878.
Denver group: Mount Bross, Middle Park, Colorado.
Laramie group?: Evanston, Wyoming; Raton Mountains, New Mexico?

Vitis rotundifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 513, 1882 [1883].
Eocene?: Admiralty Inlet, Alaska.

Vitis sparsa Lx. Tert. Fl., p. 241, pl. lx, f. 24, 1878.
Laramie group: Black Buttes, Wyoming.

Vitis tricuspidata Heer, Lx.=Cissus tricuspidata.

Vitis Xantholithensis Ward. Bull. U. S. Geol. Surv., no. 37, p. 71, pl. xxxii, f. 4, 5, 1887.
Fort Union group: Burns's Ranch, Montana.

Vitus sp.? Lx. Proc. U. S. Nat. Mus., vol. xi, p. 35, 1888.
Miocene: Contra Costa, California.

WEINMANNIA Linnæus. Syst., ed. x, p. 1005, 1759.

Weinmannia Haydenii Lx. Cret. and Tert. Fl., p. 178, pl. xlii f. 1–7 1883.
Rhus Haydenii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 417, 1873 [1874]; Tert. Fl., p. 294, pl. lviii, f. 12, 1878.
Green River group: Middle Park and Florissant, Colorado.

Weinmannia integrifolia Lx. Cret. and Tert. Fl., p. 178, pl. xlii, f. 8–13, 1883.
Green River group: Florissant, Colorado.

Weinmannia obtusifolia Lx. Cret. and Tert. Fl., p. 178, pl. xli, f. 4–10, 1883.
Green River group: Florissant, Colorado.

Weinmannia rosæfolia Lx. = Rhus rosæfolia.

WIDDRINGTONIA Endlicher. Cat. Hort. Vindob., vol. i, p. 209, 1842.

Widdringtonia complanata Lx. Bull. U. S. Geol. and Geogr. Surv. Terr., vol. i, p. 366, 1875; Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 299, 1874 [1876]; Tert. Fl., p. 72, pl. lxii, f. 13, 14, 1878.
Laramie group: Point of Rocks, Wyoming.

Widdringtonia linguæfolia Lx. Cret. and Tert. Fl., p. 139, pl. xxi, f. 14, 14*a*, 1883.

Glyptostrobus europæus (Brongn.) Heer. Fl. Tert. Helv., vol. i, p. 51, pl. xix; xx, 1855; Tert. Fl., p. 74, pl. vii, f. 1, 2, 1878.

Green River group: Florissant, Colorado.

WIDDRINGTONITES Endlicher. Synop. Conif., p. 271, 1847.

Widdringtonites Reichii (Ett.) Heer. Fl. Foss. Arct., vol. vi, abt. ii, p. 51, pl. xxviii, f. 5, 1882; Newby., Fl. Amboy Clays, p. 57, pl. viii, f. 1-5, 1895 [1896].

Frenelites Reichii Ett. Kreidefl. v. Niedersch., p. 246, pl. i, f. 10*a*-10*c*, 18—.

Amboy clay: New Jersey.

Widdringtonites subtilis Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 101, pl. xxviii, f. 1, 1*b*, 1874; Newby., Fl. Amboy Clays, p. 57, pl. x, f. 2-4, 1895 [1896].

Amboy clay: Woodbridge and South Amboy, New Jersey.

Cretaceous: Marthas Vineyard.

WILLIAMSONIA Carruthers. Trans. Linn. Soc. London, vol. xxvi, p. 680, 1868.

Williamsonia elocata Lx. Fl. Dak. Gr., p. 87, pl. ii, f. 9, 9*a*, 1892.

Dakota group: Kansas.

Williamsonia problematica (Newby.) Ward=Palæanthus problematicus.

Williamsonia recentior Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 12, pl. iv, f. 1, 1885 [1886].

Mill Creek series: Mill Creek.

Williamsonia? Riesii Hollick. Trans. N. Y. Acad. Sci., vol. xii, p. 37, pl. i, f. 2, 3, 1892.

Cretaceous: Staten Island.

Williamsonia Smockii Newby. Fl. Amboy Clays, p. 127, pl. xxxvi, f. 1-8, 1895 [1896].

Amboy clay, New Jersey.

Williamsonia texana Font. Proc. U. S. Nat. Mus., vol. xvi, p. 278, pl. xliii, f. 1, 2, 1893.

Trinity division: Glenrose, Texas.

Williamsonia virginiensis Font. Potomac Fl., p. 273, pl. cxxxiii, f. 5-7; clxv, f. 5, 1889.

Potomac formation: Trents Reach and near Dutch Gap Canal, Virginia.

Williamsonia? sp., Dn. Trans. Roy. Soc. Canada, vol. x, sec. iv, p. 87, 1892 [1893].

Kootanie: Anthracite, British Columbia.

WINCHELLIA Lesquereux. Am. Geol., vol. xii, p. 209, 1893.

Winchellia triphylla Lx. Am. Geol., vol. xii, no. 4, p. 209, pl. viii, 1893.

Cretaceous: Yellowstone, near mouth of Powder River, Montana.

WOODWARDIA J. E. Smith. Mem. Acad. Tor., vol. v, p. 411, 1793.

Woodwardia latiloba Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 391, 1873 [1874]; Tert. Fl., p. 54, pl. iii, f. 1, 1*a*, 1878.

Woodwardia latiloba minor Lx. Ann. Rept., op. cit., p. 391, 1873 [1874]; Tert. Fl., p. 54, pl. iv, f. 9, 9*a*, 1878.

Denver Group: Golden, Colorado.

Woodwardia latiloba minor Lx. = Woodwardia latiloba.

Woodwardia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 140, 1897.

Laramie group?: North Fork Dutton Creek, Wyoming.

Woodwardia sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 154, 1897.

Montana formation: Point of Rocks, Wyoming.

ZAMIA Linnæus. Sp. Pl., ed. ii, p. 1659, 1763.

Zamia Washingtoniana Ward. Fifteenth Ann. Rept. U. S. Geol. Surv., p. 350, pl. ii, f. 6, 1895.

Potomac formation: Mount Vernon, Virginia.

ZAMIOPSIS Fontaine. Potomac Fl., p. 160, 1889.

Zamiopsis insignis Font. Potomac Fl., p. 162, pl. lxii, f. 3; lxiv, f. 1, 3; lxv, f. 4–6; lxvi, f. 2; lxvii, f. 7, 1889.

Potomac formation: Fredericksburg, Virginia.

Zamiopsis laciniata Font. Potomac Fl., p. 164, pl. lxvi, f. 1, 5–8, 1889.

Potomac formation: Fredericksburg, Virginia.

Zamiopsis longipennis Font. Potomac Fl., p. 164, pl. lxi, f. 8, 1889.

Potomac formation: Fredericksburg, Virginia.

Zamiopsis petiolata Font. Potomac Fl., p. 166, pl. lxvi, f. 3, 1889.

Potomac formation: Fredericksburg, Virginia.

Zamiopsis pinnatifida Font. Potomac Fl., p. 161, pl. lxi. f. 7; lxii. f. 5; lxiv, f. 2; lxvii, f. 2, 1889.

Potomac formation: Fredericksburg, Virginia.

Zamiostrobus mirabilis Lx. = Cycadeoidea mirabilis.

ZAMITES Brongniart. Prod. Hist. Vég. Foss., p. 94, Paris, 1828.

Zamites acutipennis Heer. Zeitschr. Deutsch. geol. Gesell., vol. xxiv, p. 161, 1872; Dn., Trans. Roy. Soc., Canada, vol. iii, sec. iv, p. 7, pl. i, f. 5, 1885 [1886].

Kootanie: Martin Creek, British Columbia; Great Falls, Montana.

Zamites apertus Newby. Am. Journ. Sci., vol. xli, p. 199, pl. xiv, f. 4, 5, 1891.

Kootanie: Great Falls, Montana.

Zamites borealis Heer. Fl. Foss. Arct., vol. iii, abt. ii, p. 66, pl. xiv, f. 13, 14; xv, f. 1, 2, 1873; Newby., Am. Journ. Sci., vol. xli, p. 197. 1891.

Kootanie: Great Falls, Montana.

Zamites crassinervis Font. Potomac Fl.. p. 172, pl. lxix, f. 4; lxxxiii, f. 3, 1889.

Potomac formation: Fredericksburg, Virginia.

Zamites distantinervis Font. Potomac Fl., p. 172, pl. lxxxiii, f. 4, 1889.
Potomac formation: Fredericksburg, Virginia.

Zamites montana Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 7, pl. i, f. 6, 6*a*, 1885 [1886].
Kootanie: Martin Creek, Kootanie Pass, and Anthracite, British Columbia.

Zamites montanensis Font. Proc. U. S. Nat. Mus., vol. xv, p. 494, pl. lxxxiv, f. 4, 1892.
Kootanie: Great Falls, Montana.

Zamites ovalis Font. Potomac Fl., p. 173, pl. lxxxv, f. 4; clxx, f. 3, 1889.
Potomac formation: Dutch Gap Canal, near Potomac Run, and near Telegraph Station, Virginia.

Zamites subfalcatus Font. Potomac Fl., p. 173, pl. lxxxiv, f. 13; lxxxv, f. 3, 1889.
Potomac formation: Kankeys, Virginia.

Zamites tenuinervis Font. Potomac Fl., p. 171, pl. lxvii, f. 1; pl. lxix, f. 2; lxx, f. 1; lxxv, f. 3; lxxvi, f. 7; lxxviii, f. 6; lxxxiv, f. 7, 1889.
Potomac formation: Fredericksburg, Kankeys, Dutch Gap Canal, and near Telegraph Station, Virginia.
Trinity division: Glenrose, Texas.

Zamites sp., Dn. Trans. Roy. Soc. Canada, vol. iii, sec. iv, p. 7, pl. i, f. 4, 1885 [1886].
Kootanie: Kootanie Pass.

Zamites sp., Font. Potomac Fl., p. 173, pl. lxxxiv, f. 12, 1889.
Potomac formation: Kankeys, Virginia.

Zamites sp., Lx. Fl. Dak. Gr., p. 26, pl. i, f. 8, 1892.
Dakota group: Kansas.

Zanthoxylon Walt., Fl. Carol., p. 52, 243, 1878 = Zanthoxylum L.

ZANTHOXYLUM Linnæus. Hort. Cliff., p. 487, 1737.

Zanthoxylum diversifolium Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 33, pl. viii, f. 14, 15, 1878.
Miocene: California.

Zanthoxylum dubium Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr. 1871, suppl., p. 15, 1871 [1872]. [Not afterwards mentioned by author.]
Laramie group?: Fischers Peak, New Mexico.

Zanthoxylum spireæfolium Lx. Cret. and Tert. Fl., p. 196, pl. xl, f. 1–3, 1883.
Green River group: Florissant, Colorado.

ZINGIBERITES Heer. Fl. Tert. Helv., vol. iii, p. 172, 1859.

Zingiberites dubius Lx. Tert. Fl., p. 95, pl. xvi, f. 1, 1878.

Zingiberites? undulatus* Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 396, 1873 [1874]. [*Preoccupied by Z. undulatus Heer, Balt. Fl., p. 64.]

Denver group: Golden, Colorado.

Zingiberites undulatus Lx. = Zingiberites dubius.

ZIZYPHUS Tournefort. Ex. Linnæus, Syst., ed. i, 1735.

Zizyphus Beckwithii Lx. Cret. and Tert. Fl., p. 125, pl. xix, f. 5, 1883.

Denver group: Golden, Colorado.

Zizyphus cinnamomoides Lx. Tert. Fl., p. 277, pl. lii, f. 7, 8, 1878.

Ceanothus cinnamomoides Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 289, 1871 [1872].

Green River group: Green River Station, Wyoming.
Fort Union group: Seven-Mile Creek, Montana.

Zizyphus dakotensis Lx. Fl. Dak. Gr., p. 167, pl. xxxvi, f. 4–7, 1892.

Dakota group: Kansas.

Zizyphus distortus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 404, 1873 [1874]; Tert. Fl., p. 275, pl. li, f. 7–9, 1878.

Denver group: Golden, Colorado.

Zizyphus elegans Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 58, pl. clxxvii, f. 9, 10, 1894.

Cretaceous: Glen Cove, Long Island.

Zizyphus fibrillosus Lx. Tert. Fl., p. 276, pl. lii, f. 1–6, 1878.

Ceanothus fibrillosus Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 381, 1872 [1873].

Denver group: Golden, Colorado.

Zizyphus hyperboreus? Heer Lx. = Zizyphus Lesquereuxii.

Zizyphus Lesquereuxii nom. nov.

Zizyphus hyperboreus? Heer. Lx., Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 389, 1872 [1873]; Tert. Fl., p. 276, pl. li, f. 15, 1878. [Not *Z. hyperboreus* of Heer.]

Denver group: Golden, Colorado.
Laramie group?: Carbon, Wyoming.

Zizyphus Lewisiana Hollick. Bull. Torr. Bot. Club, vol. xxi, p. 58, pl. clxxx, f. 13, 1894.

Cretaceous: Oak Neck, Long Island.

Zizyphus longifolia Newby. Proc. U. S. Nat. Mus., vol. v, p. 513, 1882 [1883].

Eocene: Green River, Wyoming.

Zizyphus Meekii Lx. Ann. Rept. U. S. Geol. and Geogr. Surv. Terr., p. 388, 1872 [1873]; Tert. Fl., p. 275, pl. li, f. 10–14, 1878; Ward, Bull. U. S. Geol. Surv., no. 37, p. 74, pl. xxxiii, f. 5, 6, 1887.

Denver group: Mount Bross, Middle Park, Colorado.
Laramie group: Black Buttes, Wyoming.
Laramie group?: Carbon, Wyoming.
Livingston beds: Bozeman coal field, Montana.

Zizyphus microphyllus Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 28, pl. viii, f. 9, 1878.
Miocene: Chalk Bluffs, California.

Zizyphus piperoides Lx. Mem. Mus. Comp. Zoöl., vol. vi, no. 2, p. 28, pl. viii, f. 10, 11, 1878.
Miocene: Chalk Bluffs, California.

Zizyphus serrulatus Ward. Bull. U. S. Geol. Surv., no. 37, p. 73, pl. xxxiii, f. 3, 4, 1887.
Fort Union group: Burns's Ranch, Montana.

Zizyphus Townsendi Kn. Proc. U. S. Nat. Mus., vol. xvii, p. 229, pl. ix, f. 8, 9, 1894.
Eocene?: Herenden Bay, Alaska.

Zizyphus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 134, 1897.
Fort Union group: Lightning Creek, Converse County, Wyoming.

Zizyphus sp., Kn. Bull. Geol. Soc. Am., vol. viii, p. 148, 1897.
Laramie group: Rock Springs, Wyoming.

Zonarites digitatus (Brongn.) Gein.
Ficoides digitatus Brongn. Lx., Ann. Rept., op. cit., p. 421, 1872 [1873]; Hist. d. Vég. Foss., p. 69, pl. ix, f. 1, 1828.
Dakota group: Kansas.

Zostera marina L. Paisley, Can. Nat., 2d ser., vol. vii, p. 270, 1875.
Post-Pliocene: Bathurst, New Brunswick.

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[Bulletin 152.]

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63. A Bibliography of Paleozoic Crustacea from 1698 to 1889, including a List of North American Species and a Systematic Arrangement of Genera, by Anthony W. Vogdes. 1890. 8°. 177 pp. Price 15 cents.

64. A report of Work done in the Division of Chemistry and Physics, mainly during the Fiscal Year 1888-'89. F. W. Clarke, Chief Chemist. 1890. 8°. 60 pp. Price 10 cents.

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80. Correlation Papers—Devonian and Carboniferous, by Henry Shaler Williams. 1891. 8°. 279 pp. Price 20 cents.

81. Correlation Papers—Cambrian, by Charles Doolittle Walcott. 1891. 8°. 447 pp. 3 pl. Price 25 cents.

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83. Correlation Papers—Eocene, by William Bullock Clark. 1891. 8°. 173 pp. 2 pl. Price 15 cents.

84. Correlation Papers—Neocene, by W. H. Dall and G. D. Harris. 1892. 8°. 349 pp. 3 pl. Price 25 cents.

85. Correlation Papers—The Newark System, by Israel Cook Russell. 1892. 8°. 344 pp. 13 pl. Price 25 cents.

86. Correlation Papers—Archean and Algonkian, by C. R. Van Hise. 1892. 8°. 549 pp. 12 pl. Price 25 cents.

87. A Synopsis of American Fossil Brachiopoda, including Bibliography and Synonymy, by Charles Schuchert. 1897. 8°. 464 pp. Price 30 cents.

88. The Cretaceous Foraminifera of New Jersey, by Rufus Mather Bagg, Jr. 1898. 8°. 89 pp. 6 pl. Price 10 cents.

89. Some Lava Flows of the Western Slope of the Sierra Nevada, California, by F. Leslie Ransome. 1898. 8°. 74 pp. 11 pl. Price 15 cents.

90. A Report of Work done in the Division of Chemistry and Physics, mainly during the Fiscal Year 1890-'91. F. W. Clarke, Chief Chemist. 1892. 8°. 77 pp. Price 10 cents.

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122. Results of Primary Triangulation, by Henry Gannett. 1894. 8°. 412 pp. 17 pl. Price 25 cents.

123. A Dictionary of Geographic Positions, by Henry Gannett. 1895. 8°. 183 pp. 1 pl. Price 15 cents.

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125. The Constitution of the Silicates, by Frank Wigglesworth Clarke. 1895. 8°. 109 pp. Price 15 cents.

126. A Mineralogical Lexicon of Franklin, Hampshire, and Hampden Counties, Massachusetts, by Benjamin Kendall Emerson. 1895. 8°. 180 pp. 1 pl. Price 15 cents.

127. Catalogue and Index of Contributions to North American Geology, 1732–1891, by Nelson Horatio Darton. 1896. 8°. 1045 pp. Price 60 cents.

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129. Earthquakes in California in 1894, by Charles D. Perrine. 1895. 8°. 25 pp. Price 5 cents.

130 Bibliography and Index of North American Geology, Paleontology, Petrology, and Mineralogy for 1892 and 1893, by Fred Boughton Weeks. 1896. 8°. 210 pp. Price 20 cents.

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133. Contributions to the Cretaceous Paleontology of the Pacific Coast: The Fauna of the Knoxville Beds, by T. W. Stanton. 1895. 8°. 132 pp. 20 pl. Price 15 cents.

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149. Bibliography and Index of North American Geology, Paleontology, Petrology, and Mineralogy for the Year 1896, by Fred Boughton Weeks. 1897. 8°. 152 pp. Price 15 cents.

150. The Educational Series of Rock Specimens Collected and Distributed by the United States Geological Survey, by Joseph Silas Diller. 1898. 8°. 400 pp. 47 pl. Price 25 cents.

151. The Lower Cretaceous Gryphæas of the Texas Region, by R. T. Hill and T. Wayland Vaughan. 1898. 8°. 139 pp. 35 pl. Price 15 cents.

152. A Catalogue of the Cretaceous and Tertiary Plants of North America, by F. H. Knowlton. 1898. 8°. 247 pp. Price 20 cents.

In press:

153. A Bibliographic Index of North American Carboniferous Invertebrates, by Stuart Weller. 1898. 8°. pp. Price cents.

154. A Gazetteer of Kansas, by Henry Gannett. 1898. 8°. pp. Price cents.

155. Earthquakes in California in 1896 and 1897, by Charles D. Perrine, Assistant Astronomer in Charge of Earthquake Observations at the Lick Observatory. 1898. 8°. pp. Price cents.

WATER-SUPPLY AND IRRIGATION PAPERS.

By act of Congress approved June 11, 1896, the following provision was made:

"*Provided*, That hereafter the reports of the Geological Survey in relation to the gauging of streams and to the methods of utilizing the water resources may be printed in octavo form, not to exceed one hundred pages in length and five thousand copies in number; one thousand copies of which shall be for the official use of the Geological Survey, one thousand five hundred copies shall be delivered to the Senate, and two thousand five hundred copies shall be delivered to the House of Representatives, for distribution."

Under this law the following papers have been published:

1. Pumping Water for Irrigation, by Herbert M. Wilson. 1896. 8°. 57 pp. 9 pl.
2. Irrigation near Phœnix, Arizona, by Arthur P. Davis. 1897. 8°. 97 pp. 31 pl.
3. Sewage Irrigation, by George W. Rafter. 1897. 8°. 100 pp. 4 pl.
4. A Reconnoissance in Southeastern Washington, by Israel Cook Russell. 1897. 8°. 96 pp. 7 pl.
5. Irrigation Practice on the Great Plains, by Elias Branson Cowgill. 1897. 8°. 39 pp. 12 pl.
6. Underground Waters of Southwestern Kansas, by Erasmus Haworth. 1897. 8°. 65 pp. 12 pl.
7. Seepage Waters of Northern Utah, by Samuel Fortier. 1897. 8°. 50 pp. 3 pl.
8. Windmills for Irrigation, by E. C. Murphy. 1897. 8°. 49 pp. 8 pl.
9. Irrigation near Greeley, Colorado, by David Boyd. 1897. 8°. 90 pp. 21 pl.
10. Irrigation in Mesilla Valley, New Mexico, by F. C. Barker. 1898. 8°. 51 pp. 11 pl.
11. River Heights for 1896, by Arthur P. Davis. 1897. 8°. 100 pp.
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13. Irrigation Systems in Texas, by William Ferguson Hutson. 1898. 8°. 67 pp. 10 pl
14. New Tests of Certain Pumps and Water-Lifts used in Irrigation, by Ozni P. Hood. 1898. 8°. 91 pp. 1 pl.
15. Operations at River Stations, 1897, Part I. 1898. 8°. 100 pp.
16. Operations at River Stations, 1897, Part II. 1898. 8°. 101-200 pp.

TOPOGRAPHIC MAP OF THE UNITED STATES.

When, in 1882, the Geological Survey was directed by law to make a geologic map of the United States, there was in existence no suitable topographic map to serve as a base for the geologic map. The preparation of such a topographic map was therefore immediately begun. About one-fifth of the area of the country, excluding Alaska, has now been thus mapped. The map is published in atlas sheets. Under the plan adopted the entire area of the country is divided into small quadrangular districts (designated *quadrangles*), bounded by certain meridians and parallels. The unit of survey is also the unit of publication. The separate sheets are sold at 5 cents each when fewer than 100 copies are purchased, but when they are ordered in lots of 100 or more copies, whether of the same sheet or of different sheets, the price is 2 cents each. The mapped areas are widely scattered, nearly every State being represented. More than 900 sheets have been engraved and printed; they are tabulated by States in the Survey's "List of Publications," a pamphlet which may be had on application.

The map sheets represent a great variety of topographic features, and with the aid of descriptive text they can be used to illustrate topographic forms. This has led to the projection of an educational series of topographic folios, for use wherever geography is taught in high schools, academies, and colleges. Of this series the first folio has been issued, viz:

1. Physiographic types, by Henry Gannett, 1898, folio, consisting of the following sheets and 4 pages of descriptive text: Fargo (N. Dak.-Minn.), a region in youth; Charleston (W. Va.), a region in maturity; Caldwell (Kans.), a region in old age; Palmyra (Va.), a rejuvenated region; Mount Shasta (Cal.), a young volcanic mountain; Eagle (Wis.), moraines; Sun Prairie (Wis.), drumlins; Donaldsonville (La.), river flood plains; Boothbay (Me.), a fiord coast; Atlantic City (N. J.), a barrier-beach coast.

GEOLOGIC ATLAS OF THE UNITED STATES.

The Geologic Atlas of the United States is the final form of publication of the topographic and geologic maps. The atlas is issued in parts, or folios, progressively as the surveys are extended, and is designed ultimately to cover the entire country.

Each folio contains topographic, geologic, economic, and structural maps, together with textual descriptions and explanations, and is designated by the name of a principal town or of a prominent natural feature within the district.

Two forms of issue have been adopted, a "library edition" and a "field edition." In both the sheets are bound between heavy paper covers, but the library copies are permanently bound, while the sheets and covers of the field copies are only temporarily wired together.

Under the law a copy of each folio is sent to certain public libraries and educational institutions. The remainder are sold at 25 cents each, except such as contain an unusual amount of matter, which are priced accordingly. Prepayment is obligatory. The folios ready for distribution are listed below.

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16	Knoxville	Tennessee N. Carolina	83° 30′-84°	35° 30′-36°	925	25
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19	Stevenson	Alabama Georgia Tennessee	85° 30′-86°	34° 30′-35°	980	25
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	Nevada City	California.	121° 00′ 25″–121° 03′ 45″	39° 13′ 50″–39° 17′ 16″	11.65
	Grass Valley		121° 01′ 35″–121° 05′ 04″	39° 10′ 22″–39° 13′ 50″	12.09
	Banner Hill		120° 57′ 05″–121° 00′ 25″	39° 13′ 50″–39° 17′ 16″	11.65
30	Yellowstone National Park: Gallatin Canyon Shoshone Lake	Wyoming.	110°–111°	44°–45°	3,412
31	Pyramid Peak	California.	120°–120° 30′	38° 30′–39°	932
32	Franklin	Virginia West Va.	79°–79° 30′	38° 30′–39°	932
33	Briceville	Tennessee	84°–84° 30′	36′–36° 30′	963
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STATISTICAL PAPERS.

Mineral Resources of the United States, 1882, by Albert Williams, jr. 1883. 8°. xvii, 813 pp. Price 50 cents.

Mineral Resources of the United States, 1883 and 1884, by Albert Williams, jr. 1885. 8°. xiv, 1016 pp. Price 60 cents.

Mineral Resources of the United States, 1885. Division of Mining Statistics and Technology. 1886. 8°. vii, 576 pp. Price 40 cents.

Mineral Resources of the United States, 1886, by David T. Day. 1887. 8°. viii, 813 pp. Price 50 cents.

Mineral Resources of the United States, 1887, by David T. Day. 1888. 8°. vii, 832 pp. Price 50 cents.

Mineral Resources of the United States, 1888, by David T. Day. 1890. 8°. vii, 652 pp. Price 50 cents.

Mineral Resources of the United States, 1889 and 1890, by David T. Day. 1892. 8°. viii, 671 pp. Price 50 cents.

Mineral Resources of the United States, 1891, by David T. Day. 1893. 8°. vii, 630 pp. Price 50 cents.

Mineral Resources of the United States, 1892, by David T. Day. 1893. 8°. vii, 850 pp. Price 50 cents.

Mineral Resources of the United States, 1893, by David T. Day. 1894. 8°. viii, 810 pp. Price 50 cents.

On March 2, 1895, the following provision was included in an act of Congress:

"*Provided*, That hereafter the report of the mineral resources of the United States shall be issued as a part of the report of the Director of the Geological Survey."

In compliance with this legislation the following reports have been published:

Mineral Resources of the United States, 1894, David T. Day, Chief of Division. 1895. 8°. xv, 646 pp., 23 pl.; xix, 735 pp., 6 pl. Being Parts III and IV of the Sixteenth Annual Report.

Mineral Resources of the United States, 1895, David T. Day, Chief of Division. 1896. 8°. xxiii, 542 pp., 8 pl. and maps; iii, 543–1058 pp., 9–13 pl. Being Part III (in 2 vols.) of the Seventeenth Annual Report.

Mineral Resources of the United States, 1896, David T. Day, Chief of Division. 1897. 8°. xii, 642 pp., 1 pl.; 643–1400 pp. Being Part V (in 2 vols.) of the Eighteenth Annual Report.

The report on the mineral resources for the calendar year 1897 will form a part of the Nineteenth Annual Report of the Survey.

The money received from the sale of the Survey publications is deposited in the Treasury, and the Secretary of the Treasury declines to receive bank checks, drafts, or postage stamps; all remittances, therefore, must be by MONEY ORDER, made payable to the Director of the United States Geological Survey, or in CURRENCY—the exact amount. Correspondence relating to the publications of the Survey should be addressed to—

THE DIRECTOR,
UNITED STATES GEOLOGICAL SURVEY,
WASHINGTON, D. C.

WASHINGTON, D. C., *June, 1898.*

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